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Graduate and Undergraduate Courses and
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of Education

The Present Status of Education
as a Science

GENERAL SUBJECTS WITH PAPERS BY

EDWARD F. BUCHNER, CHARLES DEGARMO, GEORGE F. JAMES, CHARLES H. JOHNSTON,
ELMER E. JONES, JAMES E. LOUGH, WILLIAM H. HECK, ANNA JANE McKEAG,
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S. CHESTER PARKER, F. M. McMURRY

PAPERS PRESENTED FOR DISCUSSION AT THE MEETING OF THE SOCIETY
OF COLLEGE TEACHERS OF EDUCATION, ST. LOUIS, MO.

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WHAT SHOULD BE THE DIFFERENCE BETWEEN GRADUATE AND UNDERGRADUATE WORK IN EDUCATION?

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In the phrasing of the topic which has been selected for the opening discussion of this meeting it is to be noted that it asks a question and does not call for facts. It asks us to consider a possibility, rather than an actual condition which may be reported upon. It reads "should" and not "is." This favors a freedom which should be enjoyed by all who may participate in the discussion. It implies that our attitude toward the topic is deliberative rather than legislative.

It is also to be noted that the emphasis is to be placed on the word "graduate." This is plainly evident. Just why the development of the academic fortunes of our subject, "education," calls for such an emphasis raises another question. To anyone, however, who has thoughtfully lived through the development of our interests, as these have been expressed in the published records of our last six meetings, the timeliness of the topic is perfectly apparent.

Any discussion of the question should keep in mind as its background two important considerations: (*a*) the introduction and development of graduate work in American universities; and (*b*) the appearance and organization of education as a subject of advanced instruction. It is true that these two movements appeared, and to a large extent characterized, university developments in the last quarter of the nineteenth century. For the most part one is not warranted in believing that these two movements are mutually complementary. Just why it happened that American colleges and the few later foundations of new universities struggled with the problems of graduate instruction, is a question whose answer cannot come by citing of a single set of facts. It is interestingly true that the subject of education was first

authoritatively recognized and authorized from the graduate point of view in several of our universities. It should be clearly recognized that graduate instruction represents in general a distinct form and extent of teaching and study which is not limited to any particular subjects as such. Education, on the other hand, is a subject whose treatment extends over both graduate and undergraduate divisions of work in most institutions.

The one exception with respect to which these two movements may be interpreted as having a mutually helpful interest is education and the training of teachers. In the training for the other learned professions it has been the professions themselves, and not the universities, that have seen to it that prolonged preparation should be the method of restricting access to them. These practitioners, such as bar associations and medical societies, have made progress in securing the enactment of appropriate laws which would require extended training in the science, art, and technique of the respective professions. These movements went on during the last century largely, if not entirely, outside the universities and colleges.

In the matter of training teachers, chiefly for their own staffs, the universities have made their contribution distinctly by the creation of the so-called graduate school. The development of graduate instruction, which demands a first degree in arts or in science, represents directly what our American universities have been doing for the profession of teaching. The ripe benefits of this movement have been appearing during the last twenty years. At first the teacher in the university or in the college was to be selected from among the group of carefully elected individuals who bore the title of the doctorate in philosophy or in science. During the latter half of this period this custom has so radiated its excellent influence as to include in many quarters the practice of selecting teachers in secondary schools on the same basis. The first point, therefore, that should clearly be set forth with respect to our particular topic, is to be derived from the historical setting which graduate work has presented in our American institutions. The advanced student of the humanities seems, in most cases, to be an individual who is looking forward to the career of a teacher. In

the case of the natural sciences the career of teaching comes into competition with the careers now available in the technical professions which are directly derived from these same sciences, such as metallurgy, the different branches of engineering, etc.

The creation of a subject which shall be able to rank from the university point of view as distinctive for its own purpose is probably the best sign of progress that can be found. Our higher institutions of learning continue to maintain the interesting quality of conservatism. Before any subject is recognized by their curriculum it must run the gauntlet of all their criticisms with respect to its subject-matter, its technique, and its results. Universities have never for the most part taken the pragmatic point of view in giving their sanction to any new branch of knowledge which may be clamoring for recognition. Did universities primarily set the social values and benefits involved in their enterprises or present in the activities of nature and of society, the course of human knowledge and human teaching would have become very different from that which it has presented in the last eight hundred years. Education, for example, was during all this time, as well as long before, an individual art and a social need; but it is one of the last subjects to receive recognition under all the criteria which universities have come to adopt. This fact in itself is indicative of the distinction which should mark the kind of work in education in the two spheres specified in the phraseology of our topic.

Teaching, as an art, and education, as a body of knowledge pertaining to that art, are in many respects quite unlike technical professions, such as engineering, law, and medicine. In the latter, the student is not permitted to go out to "practice" before he has completed his training in the appropriate school, or otherwise prepared himself to meet the legal requirements of his license or to show proficiency in his undertakings. The attitude of society in these matters has evidenced considerable progress in these directions. At the same time, the institutions attempting to train these technical practitioners have been caught in the forward movement which is demanding increased time for preparation and increased specifications of the prerequisites for the professional studies. Medicine, for example, is notable because of the now fairly general

requirement that its students are to have had physics, chemistry, and biology, and two years of the undergraduate course. Various devices have been adopted to reduce the length of time from the maximum of eight years to six or five years for the collegiate and professional training of the student. The chief type of best procedure is to telescope the undergraduate and professional courses in such a fashion as to obliterate the line of distinction which, in theory, is said to exist between the former and non-professional graduate work. By permitting one year, or even two years, of the professional course to descend into the undergraduate work, the expediency attempts at once to solve the time problem for the individual and likewise maintain a high quality of collegiate training.

Teaching, on the contrary, presents an unusually weak line of resistance. Society is more slowly reaching convictions regarding the appropriate place in the school system for the college or university graduate, as well as the necessity for some professional equipment on the part of all teachers. Since teachers are made because of economic problems and motives, and not because of deliberate selection and professional zeal, the rising and falling fortunes of the individual student come to have a large controlling determination of the entrance upon, and continuance in, teaching. The student who has entered college *may* interrupt the course of his training at almost any point to go out to teach in some sort of fashion. The irregular and accidental experiences thus gained are a large part of the uncontrolled factors entering into the training of the teacher, and, in turn, fashion one of the large problems in the whole development of education. This unhappy state of affairs may, from certain viewpoints, be deplorable, and we might all be ready to say sharp things about this custom. On the other hand, the student who goes through his graduate courses before teaching is a marked rarity. Indeed, none of us are unfamiliar with the genuine suspicion which comes to fall upon the student who proposes to teach, and who yet prolongs his graduate work unduly. When viewed at such extremes, one sees sufficient ground for the conviction, entertained by some, that teaching and research are directly opposite motivations in students. The college graduate

tends to go at once into teaching, and trusts to chance fortune and chance ability to succeed with his new problems. If education has appeared in his college work, it should have aimed to secure direct beneficial results for the student, and not have been measured by any less utilitarian standards.

The question as to the difference between graduate and undergraduate work in education brings in its train a number of other questions. Is the one more elementary, the other more advanced? Are both actuated by the same aims? Is the former only a superstructure built upon the foundation laid by the latter? Should the undergraduate instruction merely aim to prepare the college graduate to go out to teach school, while the higher order of work is only to help him later to secure "a better position"? Is the difference to be determined in light of the possible changing of abilities due to increased knowledge? Are both forms of work to be estimated solely in terms of the teaching efficiency of him who receives the two lines of training? Is it a difference that can be measured in terms of the amount of actual and potential knowledge about education now in hand, as one among all collegiate and university subjects? Is it a difference that exists primarily in the mind of the teacher, or primarily in the mind of the student?

What is graduate work? And who is a graduate student? These are old and familiar questions which arise anew with the organization of each year of university instruction. We have, I believe, come to a general, yet diffuse, agreement on the points involved. We hear it said on all sides that graduate work is that which brings additions to knowledge. It is designed for the select few who can think for themselves and can maintain work on their own initiative or responsibility. It increases power through the specialization which comes with intensive and exhaustive study. It develops the pedagogical method of discovery and brings the beneficiary into a closer and more sympathetic appreciation of the whole of knowledge. It trains in technique through subject-matter.

The character of graduate work is further portrayed by the main features of the increasingly common belief concerning what the graduate student needs to know and to do. Graduate work is for one who has some working knowledge of facts in the field to be

pursued, and is not for the tyro who is ignorant thereof. This work becomes effective only when there is an equipment of the "tools" with which it is to be executed. The work itself cannot be identified with the making of these instruments of intellectual industry. Most of all, with this direct and accessory knowledge, the work demands a certain critical faculty of judgment and logical appreciation of method. So important is this factor in the work that one might say, for sake of emphasis, that the true genius of graduate work consists in the ability to weigh evidence. To this trait all other efforts lead; upon its exercise all results depend.

Is graduate work research only? Some would have us so believe, and many more long to follow after this partial misconception. If this notion is true, then most of the courses to which candidates for the Master's degree are admitted are *not* graduate courses. How many of us would be willing to have our graduate work so evaluated? The ultimate goal of such work *may* be investigation; but the truth is that many graduate courses are given for the sake of the particular and timely information they can offer and for the example of training which they may present to the student for his imitation. The research impulse does not come in a moment, but is, properly speaking, a growth out of that training and increase in knowledge which occur in the early part of the graduate period.

And who is the graduate student? At times we seem to know him best by what he is not, and then, again, by what it is thought he ought to be in comparison with his younger collegiate brother—or sister, as seems to be the case in education. The differences in age and academic integrity reveal themselves in qualities and abilities unmistakable when seen in extreme forms. The graduate student exercises independence, while the undergraduate is never discredited in his helplessness. The one has a convenient habit of falling back upon some authority; the other displays a wholesome freedom. The one does, as he is expected to do, the traditional thing; the other is urged to mark out a new field. The one is happiest when discovering the easiest way out of a difficulty; the other exerts such a grip as will permit him to think a task out to its end. The one hungers for, and lives on, emotional inspiration; the

other preserves a calmness to promote critical insight. The one is content with learning something, the other with finding something. Such is the gamut upon which the harmonies and disharmonies of teaching must be brought forth!

Any attempt to differentiate between graduate and undergraduate work must proceed in the light of the principle which ought to determine the continuity or the discontinuity of studies. The graduate work may be directly continuous with the subject-matter taken up in the college course. The line of demarkation would then touch the quality and the quantity of the earlier results as prerequisite to the later study. The principle also includes the correlations between subjects and the applications of a given subject to graduate or professional pursuits. Thus, history is a foundation for later study of law, and physics a preparation for medicine, and so on. The more formal, logical, or indirect phases of the principle of continuity of studies are, in large part, supposed to be brought together in the makeup of the undergraduate.

The arguments which have been successful in introducing the first year or two of the courses of the professional schools into the collegiate program have not fortified themselves with the strength of this principle; for, indeed, this practice tends to disrupt the progress of certain lines of work. In arranging a premedical or pre-legal course, however, appeal is made to the second form of the application of the principle. In graduate schools, as such, and in their relations to education, there is an attitude which keeps insisting upon a certain, yet varying, amount of preparation. This attitude continues to control practice. By no sort of convention have we yet been able to agree as to the principle that should guide in placing the line of cleavage between the courses the student may and must take in the two periods.

Our university practices are most confused because of another assumption that is made. The general, or undergraduate, student is supposed to receive with his increasing knowledge a certain breadth of training, while the specializing, or graduate, student is securing his characteristics by getting a wide knowledge in a narrow and restricted field. The axes of breadth and of specialization are crossed at the point of passage into the later stage of work. The

earlier student is working horizontally, so to speak; the later, vertically.

Admission to collegiate study is now made fairly uniform. Would not our graduate schools benefit directly by a somewhat similar uniformity? But our university practices vary most strikingly. In German, for example, the requirement for graduate work will vary from two to four years. In geology two single courses may suffice. In political science it may be none. The variation depends on the type of subject, such as a language, which requires a large fund of vocabulary, syntax, and literature; an extensive system of explanations, as in a natural science; or, a selected group of facts and their explanations, as in political science. If the degree of Master of Arts exists merely for advanced general work, then there can be no reasonable requirement for collegiate preparation. If this degree is for specialized work, then such a requirement is most reasonable. In the case of the degree of Doctor of Philosophy, specialization is necessary; and, with all the preliminary collegiate preparation, the usual three years are brief enough to gather all the knowledge in a particular field.

Bringing together these reflections, we may find answer to the question by saying that we should recognize a difference between graduate and undergraduate work in education in the results to be obtained, the scope of subject-matter, and the methods of procedure. These three points become six when it is remembered that we should include them twice over in our consideration of the bearing of education on the training of teachers and the attempt to hold education as a field of knowledge as objectively as possible. Education as undergraduate work helps the teacher in training to anticipate school problems, as well as prepares the future citizen in his collegiate youth to think clearly on the public and individual values of schooling. In a restricted and quasi-professional way, the undergraduate work should include as much about education as a teacher should know. Everything that will throw light on the problems of those who have to bring constructive influences to bear upon human beings normally belongs here. In graduate work the aim should be the advance of education directly through a *further* training of teachers. Otherwise educational inquiry could be

carried on by those who are not teachers, as has been done in some instances. The practical bearing of this result is no more direct and extends no farther than the general connection between all knowledge and all practice. *What is known about education is the excuse for teaching it, and it is because of the ignorance of the undergraduate (as future citizen or teacher) that this teaching should be performed. What we do not know about education is reason enough for graduate work, in the sense that advance in instruction finally becomes research.* Existent ignorance is sufficient to stimulate curiosity in the investigator. The distinction points, on the one hand, to the accepted and assured *facts* about education that the undergraduate is to learn for both theoretical and practical purposes, and on the other, to *problems* and methods appropriate to solving them which the graduate is to attack so as to return with inferences justifiable in the light of the data that are available. Put in a more practical manner, it is the difference between really preparing the teacher to teach under the conditions of the school, and carefully training the student to analyze those factors which determine the results to be secured by that teaching.

How much previous study in education should be required of a student who wishes to continue this as his principal subject for graduate work? If an institution does not make education a collegiate subject, has it any legitimate claims for demanding previous study in it by the student who may appear to elect it as either the principal or a subordinate subject in his graduate program? By what right does the university go back of the Bachelor's diploma to find out what kinds of work, and how much of each, the prospective graduate student has had?

These and similar questions receive various working, practical answers in the conditions which permit institutions to establish and to foster the teaching and the study of education. The scope of answers thus range from the single chair or group of chairs, through the school, division, or department, to the separate and independent college. A similarly efficient mode of answer is found in the even two dozen educational courses now being given, as reported by Mr. F. E. Bolton at the 1907 meeting. This pragmatic sanction of education as a subject is the most interesting aspect of all the

distinctions that have appeared in the differentiation of its specific lines. The extent of the student body and the financial resources of universities are practical situations that have compelled consistent thinking on the type and scope of work which has been most favorable toward demonstrating the actual divisions that can arise in teaching the essentials of education.

In the light of gentle reasonableness, the workable field of education, represented in the attempted twenty-four courses mentioned above, may be regarded as essentially including the history of ideas and practices, the scientific treatment of present problems connected with the individual and social phases of human life, and the technique involved in practical applications. The particular grade of teaching which the student of education may later engage in presents such a limited phase of the problem that it is fairly negligible at this moment. It is imperative that we discern clearly the unity in all education, despite the variable forms and changes which it is constantly exhibiting. The detailed work, whether undergraduate or graduate, but particularly the former, should therefore be so well balanced with respect to the threefold knowledge of history, science, and technique as will guarantee to the student, within the range of ordinary probability, an intellectual appreciation of this unity and a consequent transfer thereof into professional ability. (It has been tacitly understood that the academic equipment of the teacher is not a topic in this discussion.)

Every teacher needs, therefore, a working knowledge of the history of educational theory and practice, of the conditions of healthy human development, and of the technique involving teaching practice and public administration. The fundamental facts of education are derived from many sources. Any scheme of undergraduate work which fails the student in making plain the whence and the manner of this derivation is lacking in adequacy and genuineness. Much of the foundation work must be done in those subjects whose facts and principles can be utilized in the development of human abilities and personalities under school and out-of-school conditions. To put those needs rather baldly, one might well say, for example, the historian need not be an educator, but the educator must be something of a historian. The biologist

need not be an educator, but the educator must be a biologist. The psychologist need not be an educator, but the educator must be a psychologist. The economist need not be an educator, but the educator must be an economist. The administrator need not be an educator, but the educator must know administration. The sanitary expert need not be an educator, but the teacher must know hygiene. All these things must be, not in the sense of the expert specializing, but in the sense of the knowing one selecting and utilizing. Practically the same attitude must be maintained in the newer lines of work, such as measuring and explaining the results of education and other aspects of so-called experimental pedagogy.

It is true that our subject has profited much in some instances by the ideally sharp distinction between graduate and undergraduate work. It is not a gain in mere dignity, but a substantial gain in efforts to solve strictly school problems by accurate methods, and in a growing literature which records progress. At the same time, it should be easy to see that it is not possible in practice to generalize the difference for which the discussion is to inquire. The distinction between the two levels of work cannot be sharp and fixed. It is in fact gradual, and probably should be kept flexible so long as possible. The many graduate students in education come with diverse antecedents in both their collegiate preparation and in their types of formative teaching experiences. The instruction each one needs is most frequently an individual problem, and must be treated from the viewpoint of the status of the individual. The differences in personal abilities, as well as in collegiate training, arise more glaringly in the course of the prosecution of advanced instruction and research undertakings than in any other form of pedagogical effort. This is the testimony which comes again and again from those whose years have been given to the direction of graduate work. What is true of chemistry, Greek, history, or physics is equally, if not more, true of education. For it is not uncommon to find among certain grades of teachers a speciousness of scholarship and methods of knowledge which has set up such a group of intellectual and professional habits as utterly to unfit the individual for the undertakings of independent inquiry. It can

never be the purpose of graduate work to recover for the student-teacher the traits that are no longer retrievable. Thus the distinction between the two grades of work may really come to mean more with respect to the individual than to education as a field of work.

When one comes to consider the actual practice in the arrangement of our courses in education, he finds the general university situation to be well exemplified in education. Our universities seem to be hopelessly mixed up in the line of distinction between graduate and undergraduate work. There obtains no uniformity. There is no standardization of graduate work. And, more significant still, there is radical objection to it in some quarters.

Two illustrations will suffice to make clear the existing confusion in this practice. At our oldest university, Harvard, the situation in 1909-10, the last year reported, was as follows: The twelve courses given in education were grouped as "For undergraduates and graduates" (7), "Primarily for graduates" (3), and "Seminary courses" (2). One course only in the first group had no graduate students. One course only in the third group had only graduate students. The remaining ten courses had among their students all grades of individuals, the academic classifications ranging from three to seven. The predominant cluster of students comprised individuals of five classes. The largest course registered "graduates, seniors, juniors, sophomores, freshmen, specials, and one unclassified." This may be said to be representative of the pedagogical theory of this institution, which undertakes to reserve for the most part "the sketch courses" in different subjects for beginners, while nearly every other course contains all ranks of students.

The other illustration is to be found in the theory and practice of the institution in which I have the pleasure of working. At the Johns Hopkins University there is a sharp line of division separating the work for graduate students from that for undergraduates. The latter are not permitted to pursue any advanced courses. The former may be sent into certain undergraduate courses to make up deficiencies that exist in their previous preparation. Education was admitted in 1908 as a subject of advanced work which could

lead to the degrees of Master of Arts and Doctor of Philosophy. The establishment of the former degree at the same time was a contribution to the general problem as to what university training is desirable for the teacher. The M.A. degree, for which two years of graduate work are required, is considered more and more as the teaching degree. The subject of education is not admitted to the regular undergraduate work. An exception is made for the college courses for teachers, to which the subject is admitted, and accordingly "standardized" with reference to credits toward the B.A. degree. With reference to the distinction between graduate and undergraduate work, the situation would, I grant, become anomalous should a regular collegiate graduate present himself to take majors in education. Theoretically and apparently this condition might be interpreted as declaring that education is exclusively a graduate subject—the limbo to which a recent caustic critic would relegate it! In practice, the deficiencies in the preparatory work have to be remedied by efforts which I cannot commend as equivalent to well-articulated undergraduate study.

In view of the fact that education has been slowly making its way as a subject for research purposes, the following data obtained from *Science* (August 18, 1911, p. 196) are illuminating and encouraging. Education is now one of the thirty-seven subjects recognized by universities as offering fields in which satisfactory work may be done for the degree of Doctor of Philosophy. Twenty of these subjects are usually known as the exact and natural sciences. Education is grouped as one of the seventeen subjects in the humanities and arts. In 1911 education ranked third in the latter group in the number of doctorates conferred. It was exceeded only by the subjects of English, which had thirty-three degrees, and of history and philosophy, which had twenty-six degrees each. Twenty-three doctorates were conferred in education. The records kept by *Science* extend over the three preceding years. In 1908 there were six doctorates in education, in 1909, nine, and in 1910, thirteen. Four years are hardly long enough as a period in which to determine tendencies; but at the present time education occupies with German the fifth rank in the total number of degrees received during this quadrennium. They are preceded

by English, history, philosophy, and economics. This general state of affairs is most hopeful for the further development of the interest of our subject. The doctorate is in point of time the actual achievement farthest removed from the line of demarkation which constitutes the particular topic of this discussion. At the same time the existence of a marked tendency toward the completion of graduate work indicated by the conferring of this degree is an unmistakable evidence of the validity of the distinction which we are called upon to recognize.

To make sure that our discussion is not exclusively academic it is well to recall a situation which is now obtaining in the selection and designation of teachers in the public-school systems of the United States. It is interesting to note a marked indication by the recognition in practical school administration which is now given to the college graduate as a teacher. As was shown by the recent bulletin by Mr. H. Updegraff, of the Bureau of Education (*Teachers' Certificates Issued under General State Laws and Regulations*, 1911, pp. 164-74), there are now only nine states which do not have college graduation as a qualification for some kind of teacher's certificate. Ten states issue certificates to college graduates, but make no provision for professional studies in the college courses pursued. Ten states issue both certificates which specify a requirement of professional study and those which do not. Nineteen states issue certificates under conditions which "require that certain matters of professional study be pursued either during the college course or in postgraduate work." It is ascertained, by way of summary, "that a minimum amount of professional study is required by thirty-four states for admission to one or more of the certificates based upon college graduation."

In the first group of states are Maine, Massachusetts, Delaware, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas. The second group includes New Hampshire, Vermont, Connecticut, New Jersey, Virginia, North Carolina, South Carolina, Indiana, Illinois, and Missouri. The third group includes Rhode Island, New York, Pennsylvania, West Virginia, Texas, Oklahoma, Montana, Wyoming, Idaho, and Washington. The fourth group includes Maryland, Kentucky, Tennessee, Ohio, Michigan, Wisconsin,

Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Colorado, New Mexico, Arizona, Utah, Nevada, Oregon, and California.

These varying legal provisions, better than any other indication, specify to what extent the undergraduate, and possibly the graduate, study of education may have a useful and practical outlet in the equipment of teachers engaged in the actual work of the school. They furthermore tend to call back academic discussion of education as a subject of teaching and study in colleges or universities to the practical values in aiding teachers to make successful solutions of the concrete problems characteristic of a school career.

A comparison between a recent effort of the Bureau of Education to deal nationally and institutionally with the line of distinction specified in our topic, and the distribution of membership in our Society, may not prove uninteresting as throwing some light upon the tendencies which are appearing in the development of education as a subject of study and teaching. A few months ago Mr. K. C. Babcock, specialist in higher education in the Bureau of Education, prepared a tentative classification of colleges and universities with reference to the equipment of students who seek admission to graduate and professional schools. This effort was made at the suggestion of the deans of graduate schools in 1910. Three hundred and forty-four institutions are distributed in four groups. These classes or groups are rubrics whose definitions pertain to a certain standardization of undergraduate work with reference to graduate work. In the first class, for example, are grouped those "institutions whose graduates would ordinarily be able to take the Master's degree at any of the large graduate schools in one year after receiving the Bachelor's degree without necessarily doing more than the amount of work regularly prescribed for such higher degree." The second class represents the undergraduate status of those who "would probably require for the Master's degree in one of the strong graduate schools somewhat more than one year's regular graduate work." In the third class are placed "institutions whose standards of admission of graduates are so low or so uncertain or so loosely administered as to make the

requirement of two years for the Master's degree probable." The fourth class includes those whose standards seem to be still lower. Of the three hundred and forty-four institutions thus classified, fifty-nine are in the first class, one hundred and sixty-one in the second class, eighty-four in the third class, and forty in the fourth class. It should be noted that the second class really includes two divisions, one of which, in the case of exceptionally brilliant students or in the case of students trained in the classical course, may have a rating of the first class, and includes the starred and the "A" institutions.

This Society last year had a membership of one hundred and fifteen, eighty of whom, or 70.4 per cent, were representatives of thirty-one institutions belonging to the first class in the above classification. Thirteen members were representatives of nine institutions of the special group of the second class. Fourteen members were representatives of thirteen institutions in the other divisions of the second class, thus making twenty-seven members; or 23.4 per cent, distributed among twenty-two institutions in the second class taken as a whole. Two members were representatives of the third class. Five members of the Society were connected with institutions not listed in Mr. Babcock's classification.

Of the universities and colleges represented in the membership, thirty-one, or 56.4 per cent, belong to the first class, twenty-two, or 40 per cent, belong to the second class, while two, or 3.6 per cent, belong to the third class. The greater significance of the institutional work which is being done by representatives of this organization is brought to light by the following facts: the institutions with representation constitute a little more than one-half of those listed in the first class, and a little more than one-seventh of those listed in the second class, and a practically negligible proportion of the one hundred and twenty-four institutions comprising the third and fourth classes. From one point of view we may feel special unction in the high rating which such a comparative tabulation would seem to give to the energies of this body. On the other hand, in view of the preamble to our constitution, which states "in order to promote the teaching of education in colleges and univer-

sities of the country," we still have a very large field which needs to be exploited. The membership of the Society is distributed in fifty-five of the three hundred and forty-four institutions listed in the classification. In other words, about one institution in six has education represented as a distinct subject, so far as the membership in this organization is concerned.

Another feature of this comparison comes to light when we take into consideration the institutional groupings of our membership. Thirty-four of the fifty-five colleges and universities are represented by a single member only, nine are represented by two each, four are represented by three each, five by four each, and the remaining three by five, nine, and twelve members each, respectively. The accompanying table shows this distribution still more clearly.

CLASSES OF COLLEGES AND UNIVERSITIES REPRESENTED BY THE
MEMBERSHIP OF THE SOCIETY OF COLLEGE TEACHERS
OF EDUCATION

CLASSES OF INSTITUTIONS	NUMBER OF INSTITUTIONS REPRESENTED BY							Total
	1 Member	2 Members	3 Members	4 Members	5 Members	9 Members	12 Members	
First class.....	14	6	3	5	1	1	1	31
Second (* and A) class.....	6	2	1	..	..	..	..	9
Second class....	12	1	..	..	..	..	..	13
Third class.....	2	..	..	..	..	..	..	2
Fourth class....	..	..	..	..	..	..	..	..
Total.....	34	9	4	5	1	1	1	55

WHAT SHOULD BE THE DIFFERENCE BETWEEN GRADUATE AND UNDERGRADUATE WORK IN EDUCATION?

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I. Graduate and undergraduate studies may be contrasted as follows:

1. They may be identical, as where a graduate student begins a subject that is new to him.

2. They may differ in degree only, as when a graduate study is but a continuation of an undergraduate one. Such studies may be either pure or applied.

3. They may differ in kind, graduate study being devoted to productive scholarship or research; undergraduate, to acquiring a knowledge of the humanities and the sciences as such.

II. The type of work to be done by a student in education will vary, first, according to leading purposes; and, second, according to conditions of time, knowledge, and experience. Among the leading purposes of a study of education are the following:

1. Mastery of studies to be taught, such as mathematics, languages, sciences, etc., These must be learned as distinct and systematic bodies of knowledge.

2. The applications of certain fundamental sciences, such as psychology, logic, biology, economics, and political and social science, in the formulation, study, and solution of educational problems of organization, instruction, administration, etc. In their elementary form, these applications are made in our undergraduate courses in educational psychology, school hygiene, mental development, history and principles of education, and so forth.

III. With respect to graduate work in education, the following propositions are offered:

1. Graduate work in education for the M.A. degree should be an extension of undergraduate study in this department; because:

a) The greatest need of the student is a broader knowledge of the implications of the sciences underlying education.

b) The time is too short for effective research work.

2. The work for the Doctor's degree in education should be apportioned as follows: one-third in education proper; one-third in psychology and biology; one-third in the social sciences; because:

a) Education is an applied science;

b) It involves in almost equal degree the basal sciences named.

3. Graduate work in education should be dominated by the idea of research, but of a connected rather than of a detached character; because:

a) The chief aim of the student should be to learn through research, rather than to contribute through research.

b) Vital problems are more educative and inspiring than secondary or insignificant ones.

4. The minors should, so far as possible, be studied with their educational applications in view, rather than as pure sciences; e.g., race psychology and modern logic in their bearing upon the reconstruction of English grammar; because:

a) These studies should be pursued chiefly on account of their value for education.

b) Seminary instruction usually permits such special study and application.

5. The Doctor's thesis should, of course, be upon an educational theme, but so far as possible be based upon one or more of the fundamental sciences; because:

a) The whole graduate course is best unified in this way.

b) In the present status of education such studies are more fruitful in training and results than are those of a more detached nature.

6. The course of a graduate student in education should, aside from the thesis, be fairly well distributed over the important fields and focused upon such studies as history and principles of education, administration, etc.; because:

a) Such general knowledge is greatly needed, both in teaching and in administration;

b) It promotes more balanced, co-ordinated, and effective results.

7. Before beginning their graduate study in education, students who have never taught should be advised of the many advantages of at least a brief teaching experience.

THE RELATION OF NORMAL SCHOOLS TO DEPARTMENTS AND SCHOOLS OF EDUCATION IN UNIVERSITIES

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The problem of educational administration involved in the relation of normal schools to departments and schools of education in colleges and universities is exceedingly complex. The wide variation in efficiency among normal schools resulting from very different standards of admission and length of the course makes it impossible to speak of them as one homogeneous class. Fully as great a difference appears in the facilities for preparing teachers organized in our universities. Some college departments of education have been able to offer no more than introductory courses in psychology, history of education, and theory of teaching. In a few universities the courses for future teachers compare favorably with the training which is offered to prospective workers in other professions.

To discuss this problem clearly it is convenient to think of the normal school with a two-year course for high-school graduates and of the university department, or school of education, with a four-year course of general and special study of which one year may be professional work in the field of education and allied sciences. The necessary exceptions to these definitions can be indicated in considering the various phases of the problem.

This discussion aims to be a practical analysis of conditions which exist and bid fair to continue, and an exposition of what it seems possible to realize rather than of what may appear to be theoretically desirable. The standards here proposed are immediately workable and to that extent fall below the ideal.

The relation of the schools as above defined is primarily based on the legal certification of teachers, and some important decisions should be made within that field as a preliminary to this discussion.

Men familiar with this phase of school administration will perhaps agree that two fundamental and widespread defects appear in the legal licensing of teachers in this country:

1. Our practice inclines the young man or the young woman to try to get into teaching work by way of an examination rather than by the completion of a definite course in a recognized school. That this constitutes a defect in our system is hardly debatable. A school diploma which is gained by routine work of mediocre quality through a series of years may not have much value. An examination which measures the full power of the individual to focus experience, study, and reflection to meet a given situation is an excellent test for the prospective teacher. That kind of an examination has not yet been successfully evolved anywhere in this country or for any purpose. When one considers the widely varying standards which are prevalent in different sections in regard to admission to the teaching force he is forced to conclude that the examination is in almost every particular less effective a means of selecting young men and women for teaching than can be developed through a well-devised scheme of certification on the basis of school records. It would be much easier to maintain training schools at a fair level of efficiency than to secure uniformly high standards of examination in all of the different agencies used for this purpose. The contention is not that there is no place for the examination system in the selection of teachers, but that our present practice altogether overemphasizes this method as compared with the recognition of appropriate school certificates and diplomas.

2. The candidate who prepares adequately for teaching is given no proper advantage by most of our school legislation as over against the untrained or the poorly trained. If one glances through the laws on the certification of teachers in many of our states he will see that side by side with the license issued on the basis of graduation from a reputable school, another certificate of equal validity is granted to other candidates by many years inferior in scholarship, training, and experience. In more than one commonwealth proud of its educational system we find, for example, no legal advantage offered to normal-school graduates, as compared with young men and women who have within the limits of a public

high-school course received some instruction in methods of teaching and in school management.

To clear up the situation those who are interested in sound teaching may well consider the advisability of attempting to secure five changes in the law and practice of certification:

1. A clear distinction should be established between the certificates for elementary and for high-school teaching. In a surprisingly large number of states no such distinction at present appears. Even if the secondary license were given to the holder of the elementary certificate merely on the basis of successful teaching in a lower school, a most unsatisfactory provision, the situation would be improved as compared with the prevalent custom of many of our commonwealths of labeling even a temporary and elementary certificate good for teaching in any school, since this difference in terminology would be the first step toward a distinction in fact between the two kinds of licenses.

2. The road to certification through county or state examinations should be more carefully guarded. Every school man knows with what difficulty the integrity of these tests is maintained, alike in the framing of questions and in the examination of papers, and by integrity is meant the consistent recognition of a proper standard. When some form of interstate or national validity of teachers' certificates is established a certain standardizing of examinations will be inevitable. The situation at present is most unfortunate in many states. The county superintendent, holding his position by popular suffrage and by law intrusted with the examination of candidates for teaching positions, is exposed to local influences and political and social pressure from which he should be set free. When practical politicians in our state legislature oppose the centralization of certification in the department of public instruction they may not improperly be considered as profiting by the present practice of county examinations.

3. The intrinsic value of experience, however successful, should be much more thoughtfully weighed than at present, especially where it is made a qualification not merely for the continuance of a license but for the securing of a higher certificate. There is no serious reason why a teacher who has done good work in a given

type of school for two or three years should not be given a further certificate good for three or five years, although we are coming to recognize the need of some proof of continuous growth aside from the fact of successful teaching and to ask that such growth be indicated in one or another way at various stages of the professional career. There is very good reason why we should not accept successful experience as an adequate qualification for a license to teach in some other type of school for which special training is recognized as desirable. In too many places one may find the anomalous situation that the law permits and even school opinion sanctions the promotion of the teacher who has been successful in a given school to possibly quite different work in another school under circumstances where there is no adequate guaranty of fitness or prospective success.

4. All school courses which legally lead to certification should be accurately tested. The curricula should be standardized; the methods of teaching, the equipment, and the other conditions of efficient training should in all recognized schools be brought up to a definite and fairly uniform grade. At present very slowly and with much friction a provisional and tentative standard is evolving. The proper outcome would be greatly hastened if the intelligence, energy, and devotion of teachers and supervising officers were made to co-operate. In working for a solution of this problem an exact analysis of the situation ought first of all to be made by a committee of the National Education Association or some similar body.

5. Not less important than these considerations is the need of insistence that there shall be no short cuts to legal certification. An equality of values year for year should be recognized in all institutions which are acknowledged as training schools for teachers and whose graduates are certificated without any examination or with merely formal tests. In this particular also the strangest variation and inconsistency in both the law and the practice appear as the situation in one state after another is examined. In one great commonwealth a given form of certification can be secured in one school in from one to two years less time than is required in another public institution of the same state. There will be no professional health in teaching until from the practitioners in law

and in medicine teachers learn the obvious lesson that there should be uniform conditions of practice in accordance with their best judgment as to the good of the work in which they are engaged. Medicine is today a worthy and desirable profession largely by virtue of legislative enactments secured by physicians. The law gives promise of a career partly on account of the restrictions with which its votaries have hedged it. The usefulness of the schools and the happiness of teachers depend no less on the uniformity of the standards which they seek to maintain in the work which they hope sometime to see a profession and a career.

The fundamental problem in the relation of normal schools and departments or schools of education in colleges and universities concerns the preparation of high-school teachers. Some schools of education have courses for elementary teachers, some normal schools have four-year courses for high-school graduates organized for those students who desire to go into secondary work. Normal schools devote themselves, however, in general to the preparation of elementary teachers and our colleges and universities have given their attention almost exclusively to the training of teachers for secondary schools, in so far at least as the college or university has given thought to this particular function. The situation is changing. Owing to the general indifference of our higher institutions toward the preparation of teachers and their failure to develop adequate agencies for this purpose, the normal school has not unnaturally inclined to respond itself to the public need for trained high-school teachers and to readjust its standards and courses and equipment to this end. The administration of public education is confronted quite suddenly and over a wide area with a pointed inquiry as to whether teachers in secondary schools should be trained in normal colleges or in university schools of education.

The general question of the training of teachers for public high schools is one of the most vital educational problems of the country. Good teaching is fundamental to school efficiency, and beyond question high-school teaching compares unfavorably with that which is to be found at every other stage in the system of public instruction.

The teaching in higher institutions is admittedly much inferior

to what it should be. This is due in great measure to the general failure of candidates for higher positions to prepare themselves specifically in the art of their life work, their failure to give serious thought to the methods and principles of presentation, in a word their failure to think of themselves in their primary function as teachers. The administrative heads of our colleges and universities, in the selection of men to fill vacancies or new positions in the teaching force, have not always weighed properly the quality of good teaching (certainly they rarely take into account professional training) among the other conditions of appointment. A conservative judgment might safely affirm that two or three other qualifications are somewhat uniformly considered before this prime requisite of teaching ability. Even in institutions not well equipped for the most advanced kind of university work one may note a stress on the niceties and minutiae of scholarship, a demand for research activity, very appropriate to some well-established center of graduate study, but quite overemphasized in consideration of the failure of those same institutions to insist on sound and vigorous teaching. Nevertheless the average instruction in the college is at least respectable, partly because the number of candidates is greater than the demand and therefore a selective process is constantly functioning, partly because a knowledge of subject-matter tends to balance the lack of teaching ability since the students are relatively mature and able, therefore, to make progress in the face of odds.

The best teaching in the public schools is found in the kindergarten and in the primary grades. Here the teacher is drawn to the occupation by natural ability and inclination and is fairly well equipped for duty by some years of general study and special training. She can point to something like twelve years of liberal study and two years of technical preparation as measuring the difference between herself and the pupils who are put in her charge. It is not surprising that careful investigation seems to indicate a greater efficiency in the elementary school than in any other part of the system of public education.

The teaching in the high school represents too often a training which is not much beyond that of the pupils in the same school in

respect to years of study and is not infrequently almost lacking in the qualities of special professional discipline. To put it simply, the high-school teacher compares unfavorably with the elementary teacher both in general and special training proportionate to the respective tasks, and falls below the standard of the college teacher at least because of the longer continuance of the latter in service.

Even the rural-school situation, bad as that is, does not seem at the moment quite as difficult as is the problem of efficient high-school teaching. The rural school cannot get teachers from normal schools in sufficient numbers, but it is coming to depend with some assurance on county training schools and in several states on training departments for country teachers which are established under competent direction in connection with well-equipped and well-supported public high schools. Moreover the rural school will be profiting presently by the consolidation of districts which will bring about a higher average of instruction. In a word then, the country school, the graded school, and the college are all in a more hopeful position as far as teaching is concerned than is the secondary school.

How can a sufficient number of well-informed, well-trained, and able men and women be secured as teachers in our public high schools? The problem is one which calls for perfect frankness, and in its discussion plain English should be used and not that prevalent dialect which a delightful critic of school people has labeled "pedagogue." It goes without saying that the question should be handled with absolute impartiality and disinterestedness. The only thing worth considering in this connection is the good of the public high school. All other considerations are not only minor but negligible. How any other type, kind, or grade of school may be affected by the ultimate solution of this problem is a matter of entire and not relative indifference. The next presupposition in this discussion is perfect open-mindedness. The present situation is so absolutely unorganized, the training of high-school teachers is so undeveloped that no one can forecast with any degree of certainty what plan may be found after much reflection and experimentation to be most feasible and successful. School conditions are so different in the various parts of the country that no proposition as to the

training of secondary teachers can be expected everywhere to recommend itself immediately and obviously as the best. But on the other hand so provisional are the present efforts at training that men should be prepared rather to change the situation to adapt it to a rational plan, than to modify the plan to suit the particular conditions in any given section.

It may be worth while to point out also that in the preparation of high-school teachers no institution can claim to rule by divine right. Some of the most competent men in public education affirm that the training of all who aspire to this vocation belongs by the very purpose of its foundation to the normal school, and not merely that the candidates for all schools should be there prepared, but that they should not be prepared elsewhere. The contention is no sounder than that of some men engaged in higher institutions who declare that the preparation of teachers was the original function of the university and should be, in its more advanced forms at least, developed exclusively under such connection, forgetting that while the university gave a purely incidental and general training for teaching in early days, she has not since the development of modern schools very seriously considered even this much as her obligation.

How unsatisfactory the present situation is in regard to secondary teaching can be further illustrated by a brief word from the report on the certification of teachers prepared by Mr. Updegraff for the United States Bureau of Education. Three-fourths of the states admit legally to high-school teaching on the basis of the six-year course of study beyond the elementary school. In a very few cases some experience is made also a prerequisite or an examination is required in addition, but neither experience nor examination constitutes any notable guaranty of greater efficiency, since the experience need not be either long or remarkably successful and the examination is a not very rigid test applied to subjects already pursued by the candidate in his school course. One has reason to surmise that in those states where a higher level is set by the law, pressure is frequently exerted toward breaking down the barrier, or contriving some loophole through it.

How far this country has fallen short of a sound standard for

secondary teaching is clearly indicated by this common practice. The standard is low compared with either the elementary school or the college. The elementary school expects fully as much of the young women who desire to secure a license for teaching in it on the basis of their school attendance. Every such candidate must offer five or six years of schooling beyond the most advanced grade for which such a license is good, while on the basis indicated the high school requires only two additional years of study. The college is asking two or three years of graduate work as a condition of an assignment to teach in the first or second college year, a requirement of five or six years of study beyond the grade of the students who are to be instructed. Moreover these appointments constitute in any college a small percentage of the entire teaching force. The newly elected instructor is allowed to teach only one subject and that one in which he has made definite and special preparation; he remains as a rule permanently in service and is fully aware from the beginning that advancement will come to him only by successful experience and continuous and arduous study. As against the elementary school and the college the high school stands out with a teaching force rapidly changing and with a large percentage each year of new recruits of a low average of scholarship and of some practical experience, or on the other hand possessed of a greater acquaintance with subject-matter, balanced by decidedly rudimentary ideas as to what the high school is, what it aims to accomplish, and what its mode of organization and management should be.

The men who are in charge of school systems have come to demand three things of all candidates: first, a reasonable amount of native teaching ability; second, a fair acquaintance with the subjects to be taught; third, a definite idea of the nature of the school and some acquaintance with schoolroom management and the ordinary routine of instruction and government. Each of these is a perfectly legitimate demand, and no one need be hypercritical in asking on which of them the greatest stress is or should be laid. If some superintendents make a special point of acquaintance with school procedure and are inclined sometimes a little unduly to give the advantage to experienced candidates even when they lack

fair scholarship, the reason may easily be seen in the indifference toward professional preparation manifested by certain institutions from which young men and women seek appointment as high-school teachers although in them they cannot in any technical sense be said to have been trained.

Before considering the relation of normal schools and colleges in respect to the preparation of secondary teachers, the prerequisites for admission to this grade of schools should be stated. The question as to who may teach school used to be answered by the general affirmative "anyone," and "anyone" did as a matter of fact teach school. Later the answer came to the same query, "anyone who knows" may teach, and much later the final answer, "anyone who knows and who knows how." An eminent authority in school matters declared some centuries ago that one can very well teach even what he does not know. Sometimes it appears that not much advance has been made beyond that point of view. Not long ago a man of considerable repute among school people maintained that he preferred a teacher with knowledge only of the exact facts to be taught, on the ground that wide acquaintance with subject-matter interferes with clearness of presentation! Verily, the Roman governor seems to have sounded a warning in respect to the training of teachers when he cried out to the Apostle, "Paul, thou art beside thyself. Much learning hath made thee mad."

Public opinion supports today, however, in theory if not always in practice, the proposition that both scholarship and professional training are necessary for the teacher. It would be well if there were general consent to the proposition that from four to six years of discipline should distinguish in any school the teacher from the pupil; that no high-school teacher should be intrusted with any subject in which he has not made very definite and serious preparation; that professional training should be directed toward a knowledge of mental processes, some acquaintance with schools, past and present, some conception of the aim of education and practical familiarity with methods of instruction and modes of school organization and administration. This minimum requirement would long ago have met with general acceptance if it has not been that

colleges from which many teachers come have largely ignored the demand for technical training, and normal schools from which many other teachers come have emphasized it to the partial obscuring of the requirement for adequate scholarship. If high-school teachers should have advanced at least four years beyond the school in which they seek appointment and if they should unite to their general study a specific professional training (and more than this is not at present feasible as a general requirement, however properly an additional year might be used for this course), the question immediately arises as to where these teachers are to come from. Those who answer confidently that the only source which should be considered is the college or university with a department or school of education may be quite right in theory, but they are confronted with three facts: first, the presence in the high-school teaching force of a very large percentage of young men and women who have very much less than this preparation; second, the contention which is now common in several states and seems to be extending, that the normal school should supply all teachers needed; third, the acknowledged inadequacy of the facilities, for the training of teachers organized up to this time by college and university administrators. If the situation is to be improved three principles must be observed in the training of teachers. The opportunity for training must be first, adequate, second, organized with the maximum of economy, and third, accessible. Adequate opportunity calls for the full resources of a well-equipped college with a chance for specialized study in the subjects to be taught by each candidate, coupled with the resources of a well-developed school of education offering both theoretical and practical training. The maximum of economy in the organization of these facilities is the obvious obligation of the teaching profession to the public. This consideration points irresistibly to the establishment at one central point of these advanced facilities for the training of teachers in so far as this is to be done at public expense. The people will hardly develop by general taxation the right grade of opportunity at more than one place in each commonwealth. In view of the very great expense which attaches to advanced study they will wisely establish the opportunity where full library, laboratory, and

instructional facilities of collegiate grade are ready to hand. The third condition of accessibility suggests that the training for high-school teachers should be established in connection with colleges and universities, since in this way the factory is put near the raw material. In our larger state institutions can be found hundreds of young men and women in the Freshman and Sophomore years who have not yet come to a vocational decision, and in proportion the same situation appears in the private institutions. When the appeal to this particular occupation is made concretely in the form of adequate facilities for preparation, candidates of very desirable quality and in much larger numbers than hitherto will quickly present themselves. An additional reason why the training school for secondary teachers should be developed in connection with the university is found in the acknowledged disadvantage experienced by all isolated professional schools and felt by even the best endowed and by the most popular and successful schools of divinity, medicine, and law. For its continued efficiency each one of these is today practically forced to come into definite and close relationship with some institution of higher learning. The principle of accessibility above defined is a partial explanation of the situation. Another element is the recognized influence on individual development of the university at any great center of study, and this is of significance in the present discussion. Graduate and advanced students looking forward to different kinds of occupations form for the prospective teacher a most stimulating and helpful companionship and bring him at an impressionable age into contact with the ideals and standards presently to be effective in lines of social service closely akin to his own.

Those who maintain that in the relation of normal schools to college departments of education the preparation of secondary teachers should be assigned to the college or university must be prepared to meet considerable criticism until our higher institutions recognize this as a proper function and make suitable provision for it. Hitherto these faculties have manifested generally a persistent indifference to the whole question of the preparation of teachers and almost nowhere are facilities properly developed. Conditions are somewhat improving, and presently the professional

training of teachers may take its place along with the other higher vocational disciplines of the university. One greatly successful training college for teachers reached its efficiency because it was practically independent within a university corporation where its enrolment outnumbers that of all other undergraduates, and makes up nearly half of the total of professional students, and in which are granted on the recommendation of its faculty as many Bachelor's degrees as are granted in arts to both men and women in the oldest school within the institution. The effectiveness of that training school has made easier the campaign for the professional preparation of teachers throughout our country and the attention which some of our greatest state and private institutions are giving in other sections to the problem is a hopeful augury for the future of the work. There is reason to believe that if proper provision be made in the colleges and universities, the effort to develop courses for secondary teachers elsewhere will presently be limited to those schools which have already undertaken it.

When the function of preparing high-school teachers is definitely assumed by colleges and universities, a very close relation is desirable between the normal schools and the higher departments or schools of education. A normal-school graduate with experience in elementary teaching and with a thorough college course in the subjects which he expects to teach is the best kind of material in a high-school corps of instructors. The capable and ambitious men and women of this type who have a preference for secondary teaching should be encouraged to go on from the normal schools to the college or university, and should receive due allowance for earlier studies.

A minor question therefore and yet one of some little importance in the relation of the normal schools to departments or schools of education in universities concerns the amount of college credit which should be allowed for the normal-school course. The widest variation appears in the practice of our higher institutions on this point. Some give no credit except on examination. Some allow less than one semester, and others allow more than two years. No such difference appears in the comparative rank of the colleges and universities here indicated, and hence it is evident that this ques-

tion of credits deserves most serious consideration. The fairly uniform practice of state universities (and these receive the greater part of the normal-school graduates) is to allow credit year for year. Private colleges over a considerable area follow the practice of the state institutions. The propriety of granting credit to this extent is based on the assumption of equal efficiency of the instructor and equal ability and industry in the student in the normal schools, as compared with the first two years of college work. This assumption seems well founded throughout the greater portion of the United States. The normal-school graduate who goes on to university study is, as a rule especially capable and ambitious and takes with him in most instances many valuable results of teaching experience. That the normal-school course is somewhat technical compared with the studies usually pursued in the first two college years need not be taken as a serious element in the allowance of credits in consideration of the greater maturity and earnestness of the experienced normal-school graduate. Whether prospective high-school teachers of this type, however, can in the two remaining college years get the necessary command of the subjects which they are to teach is a more vital question. To meet this difficulty normal schools will probably be including hereafter rather more generally in their curricula the elements of foreign languages and of social, mathematical, physical, and biological science as elective courses for those who look forward to college study. The allowance of full college credit for normal-school studies is the custom already in the great majority of colleges and universities, and is more likely to be extended than restricted. No student, however, should be granted more credits for a given period of study than he could have acquired at the college or university in the same length of time.

Some colleges have been in the habit of giving credit toward graduation on the basis of teaching experience. The danger of such a practice is suggested in the inquiry which a teacher of long experience addressed to the authorities of a certain institution, at a time when university extension courses were especially popular and the teaching force was somewhat agitated over promotional examinations and certificates of advanced study in their relation to the

salary schedule. The woman in question is reported to have stated that she had been teaching for twenty-two years and to have asked how much longer she must continue in service in order to secure a Bachelor's degree from that university. On the basis of mere experience no credit should be granted, but those students who can by proper tests give proof that experience and study have secured for them the practical equivalents of certain college courses are entitled to suitable recognition.

The function of the normal school is primarily to prepare elementary-school teachers. The function of a department or school of education in a college or university is to give a professional training of higher grade. According to the soundest theory and practice no serious overlapping of scope or field need develop if higher institutions of learning care to undertake this type of vocational discipline and will give to it the same support which is now extended to preparation for other lines of social service. If colleges and universities do not equip themselves to train high-school teachers effectively, the normal-college idea is sure to spread and the state will be called upon to maintain a training school for higher teachers apart from its university at a certain loss in efficiency, economy, and accessibility. The relations of normal schools to departments or schools of education in universities will be worked out first of all in respect to field or function in state systems of public instruction. When this fundamental problem is solved other questions at issue will easily be answered.

THE RELATION OF FIRST-CLASS NORMAL SCHOOLS TO DEPARTMENTS AND SCHOOLS OF EDUCATION IN UNIVERSITIES¹

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Speaking from the purely administrative point of view the question of the relation of the functions of normal schools and the functions of colleges, state universities, and endowed universities, in so far as professional preparation of public-school teachers is concerned, will for a long time be differently solved by the different states. Expert educational opinion will play, it is to be hoped, a large part in this differentiation of function. If such considerations could become the chief directive force in developments for the next half century, some uniform plan for the co-ordination of existing agencies for preparing teachers, and the elimination of some, might confidently be looked for. When one considers, however, the obstacles to such a logical and ideal solution of this problem, he may with assurance prophesy an era of educational experimentation and exploitation. The purely administrative obstacles to any permanent co-operative relationship, as I see them in one state even, are numerous and genuine. I shall attempt to illustrate them by statistical tables later on.

All discussions of our question, whether administrative or purely educational, must begin with an assumption which is itself contested in college circles. This assumption is that professional preparation of teachers of all ranks is essentially analogous to the professional preparation of lawyers, physicians, or engineers. Until we can demonstrate decisively this assumption to our colleagues in university faculties, and secure their constructive co-operation and

¹This paper represents the author's attempt to state the problem as it appears when interpreted mainly from considerations suggested by the developments in Kansas. A brief outline of Dean James's proposed discussion, received after this paper had been prepared, indicates that the treatments will not seriously overlap.

interest, we shall have to work along with the deadening exasperation of being tolerated, distrusted, and even checked by actual opposition.

Granting this assumption, which of course we shall demonstrate, and I believe are demonstrating as fast as we can, we of the colleges and universities have next to demonstrate to our clientèle, the leaders among public-school men, that they cannot do without us. This is also in many places a contested assumption. There is a *vaguely felt* conviction that college graduates somehow in the long run do better than normal-school graduates in high-school positions, do not do so well in the elementary school, and are the only class from which to draw those who are to become, with *additional academic training*, the college teachers of all ranks. What is almost universally lacking is any *articulate conviction of what essentially pedagogical equipment of undergraduate and graduate grade is essential for either the high-school or the college teacher*.

A third assumption is that, where different types of institutions organize to prepare teachers, there must be some co-operative state plan put in operation whereby needless duplication of function may be avoided, and where the natural developments of these same institutions may continue as rapidly as possible. These institutions are: (1) county institutes, (2) normal-training high schools (or other institutions by different names of about the grade of high schools), (3) first-class normal schools, (4) colleges of "recognized standing," and (5) universities. At present lack of co-ordination is evident, and lack of co-operation and harmony conspicuously so. County institutes will either pass away entirely, or eventually come under the control of one or more of the other agencies, or be better directed by state superintendents, and function as extension summer schools for rural teachers. High schools, under some name, or city training schools, for some time in some state, encouraged by state or municipal aid, will strain to furnish to their students, contemplating immediate entrance upon primary-grade teaching, some temporary pedagogical training.

Further dogmatic prophesying may be inexcusable. The future development of normal schools, supported by the state, and expecting considerable federal support also, is critical and prob-

lematic. I find the conviction voiced by at least three normal school presidents that these institutions must vigorously expand or else be crushed by the upper millstone of the university schools of education and the nether one of the multiplying agencies of lower grade already mentioned. The increasing number of normal schools awarding the Bachelor's degree and receiving recognition for their graduates in the graduate schools of leading universities serves adequately to indicate the ultimate ambitions of these schools to become "recognized colleges."

It is a still more delicate task to diagnose the policies of those who articulate and determine the pedagogical functions of colleges and universities. Degree-giving institutions are sufficiently plentiful in every state already. But degrees of traditional academic connotation *per se* are no longer adequate pedagogical passports for entrance into respectable teaching ranks. Colleges and universities, in many instances, have reluctantly "humored" the popular "superstition" that prospective teachers can profitably focus attention upon systematic courses of instruction, sequentially related, which bear directly upon their professional training. The force of this academic tradition doubtless partly accounts for many of the partially well-grounded criticisms of pedagogical courses. These have been held mercilessly to certain inherited notions of what constitutes "academic merit," and criticized in the same way for not producing more tangible professional results. The whole thing has too often been a sham concession, from those of the legislating college majority, to a supposedly mistaken social demand. The colleges and the universities heretofore have not been forced, either by their own educational conscience or by their estimation of the actual effect of their attitude upon their own enrolments and support, to work out this problem constructively. Nor do I believe there is yet any evidence of panic. I do, however, believe that there are some indications of a more positive constructive interest on the part of our scholarly colleagues in the broader educational questions of school economy, administration, historical evolutions, psychological foundations, and particularly the specialized pedagogies of special branches of study. When such scholarly forces go farther than tolerate purely educational study

by taking a hand themselves in studying and offering pedagogical courses there will be no longer a question of where one shall go for high-grade pedagogical enlightenment, nor a question of who will go. All will go who can gain entrance, all who aspire to any grade of teaching whatsoever, college or otherwise.

Such a preface settles nothing. It is, however, basal to every consideration I can respect regarding an adequate conception of the future developments of university work in education. It affords a basis for the differentiation of the pedagogical functions of normal schools and universities. The purely *educational question* of differentiation of subject-matter, scope, method, and equitable "division of labor" of existing agencies founded and equipped for the training of teachers requires a different method of attack, namely, an examination of the ruling conceptions which govern the educational activities and ambitions of normal-school men and of university men.

Omitting consideration of those normal schools, a large number, described by President Pritchett as institutions "competing with the high school and even the elementary school, as well as with the small college," we may represent the best class only. I shall state their point of view as fairly as I can. Briefly it is this:

The normal-school movement for the last seventy-three years has developed with the fundamental conception itself of training for teaching as a profession. It is as clearly a part of the public-school system as is the public grade school. The high school is a development from the elementary school, and so professional preparation of secondary teachers becomes logically an added responsibility and function of the developing normal school. Furthermore, the normal school is distinguished by having as an exclusive purpose the training of teachers. Consequently, bent upon its own business, its program of studies and curriculums make no claim for those literary and scientific fields of leisurely exploitation idealized by other types of educational institutions. Every course is, within liberal limits consonant with broad modern conceptions of education, a distinctly professional study. Everything points vocationally. Those desiring any education whatsoever, other than teaching in public schools, must go elsewhere; for

its courses look toward the mastery of a well-organized body of pedagogical theory, embracing historical, social, economic, administrative, psychologic, and specifically technical questions. Its training school for practice must extend perforce to the secondary school. "The normal-college curriculum" must embrace all types of instruction which we find represented in the public schools, and few, if any, others. Further, the standard of values must be distinctive, and in the broad sense vocational. Arithmetic may be more important for the teacher than the calculus, reading than philology, geography than geology, nature-study than embryology. If so, no academic logic of tradition may gainsay. Content, free mastery, and skill in pedagogical application must test the principle governing the choice of studies in the normal-school curriculum. Organization of content for presentation rather than the dominant college ideal of organization for further discovery, for research, is to be the aim.

Again, in the whole field of teacher-training the normal school has, by virtue of priority, a right to enter. It has gone through the grilling, and come out of it more than alive. Its best thought and effort have been given to the preparation of the regular grade teacher. This has illustrated what it can do, and justifies its enlargement and equipment for more extensive service. It must work out a plan for the specific preparation of rural-school teachers, and assume the leadership of the county normal schools and such institutions. It must for the same evident reasons prepare those who are to teach and supervise the newer subjects, music, manual training, domestic science, and agriculture. It must do systematic extension work and correspondence instruction. For its ambitious advanced students and graduates advanced study must be offered looking toward superintendencies, principalships, general supervision, critic work, and high-school teaching. Likewise institutional visitation or official school inspection must cover the high-school territory.

The ruling conceptions of the college or university are not so easily stated. Further, they are unfortunately conflicting at certain critical points. One by one professional schools—law, medicine, and engineering—fostered within the college organiza-

tions of programs of study, have cut themselves loose and thrive practically independent, built upon a certain amount of college work and organized with strictly prescribed curriculums. Meanwhile the college of liberal arts, with practically no reference to the alleged professional necessities for its large percentage of prospective teachers, has of late foresworn its allegiance to the elective system (a sort of recognition that vocation might affect choice of studies), and set about formulating grouping systems and advisory systems. All such regulations of students' work are supposedly governed by educational principles quite other than professional ones. They are supposed to insure general culture, or education untainted and undiluted by professional details. Only the legal minimum in education courses is condoned. More than this is often distinctly and officially frowned upon. As a consequence those college graduates are not as well prepared to enter upon their postgraduate work in education as are those who elect other subjects. Departments of education, however, in any way one considers their evolution, have greatly prospered. Without the admittedly professional atmosphere of the normal school they are advancing inevitably beyond the status of weak departments or sub-departments toward larger organization units. Their intimate, even in many respects integral, relationship with purely academic work, with its drawbacks, has still somehow been their distinguishing feature. The evident tendency now to organize the work for the professional equipment of those college students looking toward teaching as a career into "schools" marks a severely critical stage of development. It implies, among other obvious enlargements as to equipment, a thoroughly equipped model high school, a larger faculty, and *distinctly professional regulation of its own affairs.*

This separate organization for a select professional group of the student body has not been done in entirely good faith. It has not been thoroughgoing. It has often been a renaming of courses, a sort of tentative and timid organization, mainly within the college of arts. The work in the departments of education itself, and some so-called teachers' courses, with possibly some technological courses (drawing, manual training, home economics, etc.) make up the curriculum. In no case, I believe, for example, has a definite part

of undergraduate college work in history been planned with reference to the intending teachers of history, organized in such a way that they may study the whole field covered in an elementary way by the high-school curriculum. In other words, the college goes on its way in its grouping systems and other regulations and lets the prospective teacher make his own way through whatever departmental labyrinths he may chance to find, or be guided by some head of a college department of study who often estimates professional preparation in terms of hours of academic specialization only. The student who is to teach certain chosen subjects is much in the position he would be in were he in a medical school trying to find sequentially related courses bearing upon high-school hygiene and physiology.

Our problem seems to be this: Can a department or school of education map out its distinctive field under the above conditions? I do not believe it can. It must be assumed that in most cases schools of education must work largely, if not entirely, with the same students as the college of liberal arts and the graduate school, that most of its students must have or get their A.B. degree, and that some considerable portion of their undergraduate work must be directed by those representing the interests of the School of Education. This in the end means some reorganization of the work in the academic departments, which are related to high-school study. It means that the School of Education must be largely an organization *within* the college and some of the more independent professional schools; not a separate organization with its own distinctive student body, nor, possibly, faculty body. It must mean this at least until most education work can be of graduate grade, or until the college will relinquish the directive authority over those of its own Seniors who intend to teach. I personally should prefer at the present time the organization into a "school" in this provisional sense, to retain the function of certification, to give no Education degree, and to justify the larger type of organization by emphasis upon graduate work, and by the extension of professional service to teachers by such extra-instructional and extra-mural work as direction of practice high school, the extension courses, the appointment of teachers, the organization of *Probejahr* teaching, a

system of scientific high-school visitation and counsel, the development of schoolmen's conferences at the university, and the extension of facilities for summer-school work, both graduate and undergraduate. Another inviting field is that of training the teachers of the professional and psychological work in high schools, county normals, and city training schools.

As I see the problem, we professors of education have not succeeded better than we have chiefly because we have had to *work alone professionally*. What is most needed in most universities is the active and definite co-operation of the leaders among the scholars of the faculties, particularly of those who combine their scholarly interests with their intelligent concern for the high schools. The purely educational field is of itself big enough to be bewildering, big enough for bona-fide academic courses, for purely research graduate seminars, and for varied technical courses. Beyond this, professors of education are handicapped by trying to give the specialized sort of technique of instruction in given fields of foreign languages, mathematics, history, science, etc. We shall never be able to do this adequately. Yet it must be done. It must be done within the organization of the School of Education and under the sanction of the authorities who conceive the functions and administer the policies of universities. President Pritchett thinks the teachers' course the crux of our problem. In a sense, it is. Teachers' courses, so called, must be conceived. They must become the most severely technical and avowedly professional of all our pedagogical work, given in good faith by those who know. The organization of all academic work leading to them will be done through prerequisite elementary college courses, covering with as much economy of students' time and credit hours as is possible the material which constitutes the work of the high school. Other prerequisites, such as the history and psychology of education, will still further emphasize the value of such authoritative technical courses and put a premium upon their professional value. The former apathetic co-operation of our scholarly colleagues and specialists, who offer these courses often under protest or who generally make a misnomer of some academic course, has dampened the professional atmosphere both for ourselves and our students.

It has been due in large part to their actual ignorance of such purely educational considerations and conceptions as the modern available material in the history of education, educational psychology, educational administration, and educational statistical investigations furnish. This ignorance and natural suspicion is passing, and when it has passed the main obstacle to adequate university preparation of secondary teachers is removed. *A genuine professional organization practically within the present resources of our universities is possible.* Then hard, but harmonious, uninterrupted work for teachers will be as it ought long ago to have been, one of the specific aims of universities.

If the above account is correct, the normal-school insinuations that the universities are not equipped for training teachers will no longer hold.

Consequently some plan for the co-ordination of the pedagogical functions of these two institutions becomes evidently necessary. It is consequently clear from such purely theoretical considerations as those above outlined, that the differentiation, with reference to these teacher-training institutions supported by the state, should correspond to the actual differentiation of elementary and high-school grades of instruction, particularly as both fields are unlimited in the genuine and pressing problems they offer for extended scientific investigation. Another consideration not yet much emphasized is that modern high-school instruction is academically of about the grade of normal-school instruction and that the high school is becoming itself much like a junior college.

The following statistical account of a careful investigation of the present situation in Kansas, 1911, analogous in essential features, I judge, to those of other states, points likewise toward the above as the only conclusion possible. Such practical existing administrative necessities, aside from the theoretical ones, justify, I hope, the position taken in regard to the relation of normal schools to schools of education in universities. The data reported represent the facts in regard to the training for teaching of 1,345 high-school principals and teachers, including also superintendents of these schools in Kansas. The third-class schools indicate schools not offering a full high-school course.

SUBDIVISION OF THE 1,345 TEACHERS ACCORDING TO INSTITUTION ATTENDED*

	First Class	Second Class	Third Class	Total
University of Kansas	221	33	3	257
Kansas State Agricultural College	46	9	2	57
Other colleges†	380	77	19	476
University of Kansas and Kansas State Normal	50	6	2	58
University of Kansas and other normal	4	3	0	7
Kansas State Normal and other college	58	17	3	78
Other colleges and other normal schools	74	14	5	93
Kansas State Normal	132	52	23	207
Other normal	33	13	3	49
High school	17	6	3	26
Special	32	5	0	37
Total	1,047	235	63	1,345

* The tables and charts have been prepared by Professor H. W. Josselyn, of the School of Education.

† The totals for other colleges can be subdivided as follows:

	First Class	Second Class	Third Class
Kansas colleges	220	64	11
Out-of-state Colleges	160	13	8
Totals (compare above)	380	77	19

Total teachers reporting 1,345—

Total first class	1,047
Total second class	235
Total third class	63

Total 1,345

Degrees—

University of Kansas	211 A.B.	} First class
	24 A.M.	
	11 B.S.	
	1 M.S.	
	6 Fine Arts	} Second class
	21 A.B.	
	3 A.M.	
	1 A.B.	Third class

Total 278 University of Kansas

Kansas State Normal	12 A.B.	First class
	5 A.B.	Second class
	2 A.B.	Third class

Total 10 Kansas State Normal*

* The Kansas State Normal School has only recently awarded degrees.

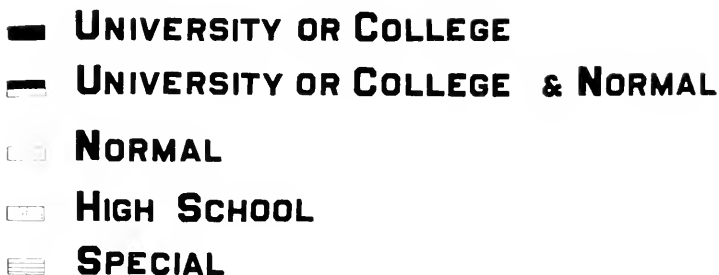
A**TOTAL NUMBER TEACHERS****SCALE ■ = 80**

CHART A

This chart shows the number of teachers who as students were enrolled: (1) In some university or college; (2) in some university or college and some normal school; (3) in some normal school; (4) in some high school only; (5) in some special school.

1 . . .	790
2 . . .	236
	<hr/> 1,026 have been enrolled in some college or university.
3 . . .	256
4 . . .	26
5 . . .	37
	<hr/>
Total	1,345






TEACHERS BY SCHOOLS

B

FIRST CLASS

SECOND CLASS

THIRD CLASS

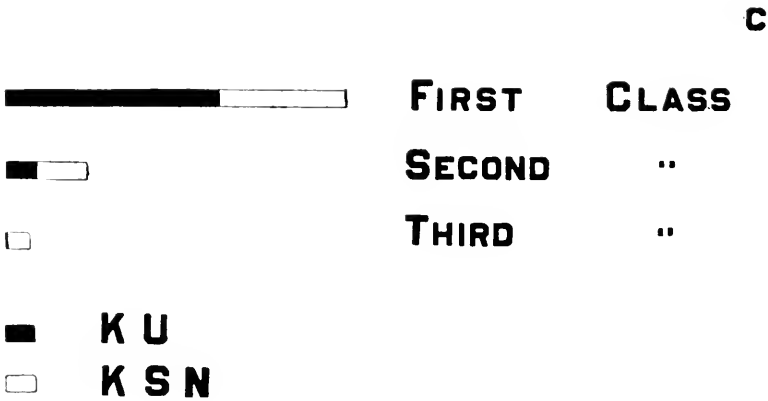
-  UNIVERSITY OR COLLEGE
-  UNIVERSITY OR COLLEGE & NORMAL
-  NORMAL
-  HIGH SCHOOL
-  SPECIAL

SCALE ■ = 80

CHART B

This chart shows the training of teachers on same plan as Chart A, but gives the details for each type of accredited school rather than the total for all three classes.

	First Class	Second Class	Third Class	Total
1. University or College	647	119	24	790
2. University or College & Normal	186	40	10	236
3. Normal	165	65	26	256
4. High School	17	6	3	26
5. Special	32	5	0	37
Totals	1,047	235	63	1,345



SCALE ■ = 32

CHART C

This chart shows the comparison between the number of teachers who received their training at the University of Kansas and at the Kansas Normal School. Teachers who have been students at both a normal school and a college are not included in this chart.

	First Class	Second Class	Third Class	Totals
University of Kansas.....	221	33	3	257
Kansas Normal.....	132	52	23	207

TEACHERS WITH DEGREES FROM K U & K S N ^D

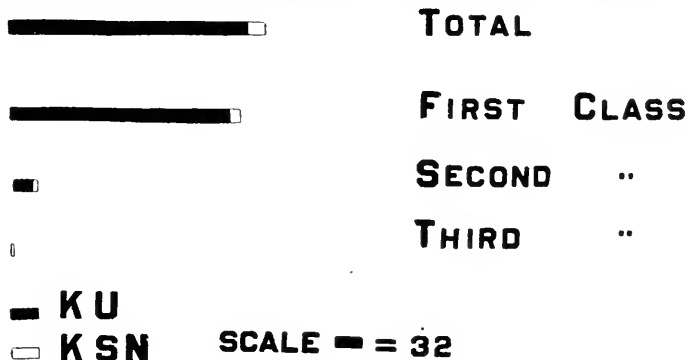


CHART D

This chart makes an interesting comparison between the Kansas Normal School and the University of Kansas in regard to the number of teachers who hold degrees from each school.

	First Class	Second Class	Third Class	Totals
University of Kansas.....	253*	24†	1	278
Kansas Normal School.....	12	5	2	19

* Includes 24 A.M.; 11 B.S.; 1 M.S.; 6 Fine Arts.

† Includes 3 A.M.

E**1****2****3****— K U****▨ KANSAS COLLEGES****▤ KSAC****▧ OTHER ..****▩ KSN****SCALE — = 80****SEE NOTE**

CHART E

This chart shows a comparison in regard to the number of teachers who received their training in: (1) the University of Kansas; (2) other Kansas colleges; (3) Kansas Agricultural College; (4) colleges outside of state; (5) Kansas Normal School.

	First Class	Second Class	Third Class	Totals
1. University of Kansas	221	33	3	257
2. Kansas Colleges	220	64	11	295
3. Kansas State Agricultural College	46	9	2	57
4. Other colleges	160	13	8	181
5. Normal School	132	52	23	207

NOTE.—Teachers who have been enrolled in both a university or college and a normal school have not been counted here.

If we keep in mind the above statistical analysis of school relations in a given state and apply a plan¹ outlined for Massachusetts to the Kansas situation, the following conclusions appear evident:

State and not local school communities must impose standards for all public schools, but especially state-aided high schools (one hundred and sixty Kansas normal-training high schools).

Candidates must have, in addition to a thorough high-school course, (1) a thorough knowledge of at least two academic subjects, such as is possible only in a four-year college course; (2) with (1) as a prerequisite, *scientific modern pedagogical knowledge*; and (3) should have some experience in practice teaching under supervision of experts.

If Kansas resorts to the single standard for granting certificates (as voted by the Association of Kansas Colleges and indorsed recently by State Board of Education), there are three possibilities open to this state for profitably certificating high-school teachers.

PLAN I AND OBJECTIONS

Plan I is to set apart one of the normal schools for high-school teacher preparation wholly, which school shall adhere strictly to college-entrance requirements, and give no certificate on other terms, and add required practice teaching in model high school.

Objections

1. All state colleges would object, and also the University, as all these above institutions are now recognized legally as agencies whose largest function is the preparation of high-school teachers, not only in Kansas but everywhere in the United States.

2. Some of the best prospective high-school teachers would not attend. It would probably result in becoming an institution for women only.

3. The equipment and the faculty qualifications necessary to equal the college or university academic equipment would be expensive and costly, and would duplicate college and university plants which are already available and developing in this direction.

4. As statistics given above show clearly, this plan would deprive the most numerous and most needy teacher class, the primary-grade teachers (4,000 in number), of the natural, traditional, and at present specifically equipped institution, the normal school, whose foundation for existence has been that it prepare elementary teachers. It involves the illogical duplication of the College of Liberal Arts of the University by the Normal School, and hence diverting its function from elementary-school problems to high-school problems—to the detriment of both.

¹ See David Snedden, "The Certification of High-School Teachers," *Education*, January, 1911.

PLAN II AND OBJECTIONS

Plan II is to set apart one normal school to train high-school teachers, but require graduation from a college for admission, and confine the course to graduate professional study and practice teaching.

This plan we should probably have to resort to if there were no graduate schools already, and if the state colleges were disinclined to co-operate in developing facilities for secondary professional training. However, both these latter alternatives exist with unusually favorable tendencies in Kansas already.

Objections

1. It would duplicate and discourage existing facilities for graduate work in the University and elsewhere.

2. We could not induce the prospective college-graduate high-school teachers to choose this postgraduate course instead of what the University Graduate School offers. This class of University Seniors in College and School of Education is the state's largest single outgoing group of young high-school teachers.

3. It would be unjust to all the agencies now existing and legally recognized and consciously organized for this work.

4. It would be very expensive, and undergraduate work, particularly in education courses, would suffer from lack of relation to graduate professional work.

5. It would satisfy no existing state institution, but merely add another.

PLAN III

Plan III assumes that the preparation of high-school teachers involves the completion of academic work of college quality, professional work in education courses, and practice teaching which cannot be given well without the college course foundation.

Points favorable to this general scheme in Kansas are:

1. This is the direction of development which in the overwhelming majority of communities the main body of our high-school profession is now taking (cf. statistics above).

2. This is the precedent set by nearly all the states where legislation has defined the way.

3. This scheme best encourages the high-school teacher to carry on in a natural sequence his further professional work into graduate study, through summer schools, additional year's leave of absence often, and through correspondence and extension work.

4. This is the natural way in which, in time, the teaching profession may expect, as in the professions of law and medicine, to build its technique and specialization on a broad fundamental training, furnished partly by scholarly academic colleagues, as suggested above, and to make its professional degree or diploma signify an equipment which is a dignified distinction.

5. This is just to the state colleges as well as to the university, whose specific study in education has always been the problems of secondary education.

6. This is entirely in line with the resolutions of the National Education Association (*Report of Committee of Seventeen*, 1907) on Professional Training of Secondary Teachers.

7. It is consistent with the views expressed by supposed experts in the recent *Fifth Annual Report of the Carnegie Foundation for Advancement of Teaching*, 1910, pp. 75, 76, 77.

8. In the writer's opinion any sort of preparation short of this has always been recognized as provisionally acceptable only. In view of better, not as good, preparation of high-school teachers, and in view of the new disposition of all colleges to recognize more fully that this is their greatest professional duty and opportunity, it seems that any checking or side-tracking of this development would be a calamity.¹

9. The ideal within a decade or two for Kansas is to be able to adopt, with certain modifications, California's requirements—a year of graduate study in work offered by a School of Education, including supervised practice, in addition to a four-year college course, which shall include some of the purely academic courses in education.

10. The better high-school men in the field, to a man, demand something of the sort suggested in Plan III. One extended report in *Education*² includes replies from leading high-school principals in every state in the Union, representing schools employing 4,200 high-school teachers. The author's conclusion is that we must look to some such plan as our Plan III, and, as soon as possible, to some such standard as that set by California. One sentence, p. 332, is: "The present type of normal school will not do."

11. Another specific argument or evidence that Plan III is best is the recent action of the State School Superintendents' Association of Michigan. The report, adopted unanimously by the above association and later, November, 1910, also unanimously by the Michigan State Teachers' Association, representing members of the university, the agricultural college, all the normal schools, and all the grade as well as high and private schools, recommended legislative action providing full equipment at the state university (\$300,000 building for practice teaching included) for carrying forward the work of training secondary teachers.

The following account of the nature of professional work for teachers, from an examination of the 1910-11 catalogues of the Agricultural College, the State Normal School, and the State

¹ Of the 66 graduating from a denominational college of the state, 61 secured the state certificate, each doing at least 15 hours in courses in Education.

² January, 1911; article by R. J. Condon on "What the Schools Need."

University, are based upon comparisons made without drawing any parallel for the courses in pure philosophy and pure psychology or in other academic departments. Leaving out all references to these related fields and considering the *pure education courses*, we find:

1. The Agricultural College offers (by their divisions of spring, fall, and winter terms) in all eighteen hours of education, and has one professor who (according to the catalogue) does all this work and all the work in the department of philosophy besides. It has no legal function of awarding teachers' certificates.

2. The State Normal School offers nineteen courses in education (not including the courses in philosophy and psychology). There are offered in all forty hours of instruction in these subjects (given in some of the first, second, third, fourth, or fifth terms as they divide their work for the year). Nine of their nineteen courses offered are described in the catalogue as designed for elementary and kindergarten teachers. This means that eighteen of the forty hours are for this phase of professional work. Only one course, possibly two (possibly four hours of the forty), is designed for prospective high-school teachers. The rest of the work is general and of such a nature that it could fit in with almost any pedagogical purpose. The preface to the four courses (eight hours) of *practice teaching* reads (p. 77 of 1910-11 catalogue): "The Training School offers teaching and observation in all the grades from the kindergarten through the grammar school," clearly indicating that up to the present year preparation for grade work has been objective.

3. In the preface to the University School of Education *Bulletin* occurs this statement of purpose: "The courses are planned to meet the professional needs of the following classes: College and normal-school instructors in education, superintendents and principals of schools, heads of departments in normal and high schools, supervisors of special subjects, and teachers in high schools." Not including here any of the teachers' courses in special branches, such as history or Latin, nor courses in philosophy and psychology, as these were omitted in the statement of the other schools' equipment, the University offers sixty-eight hours (twenty-seven courses) in pure education, none of them designed for any teacher-training

purposes below those for high-school positions. Legitimate inferences from both our theoretical considerations and our survey of actual conditions seem to be:

1. The tendency in the better, larger, and more important schools, which can secure and retain the best teachers available, is to demand college-trained and professionally equipped teachers.

2. In the second and third classes of schools, relatively much fewer in numbers, the percentage of graduates from all colleges is in the former about twice, and in the latter about equal to, that of normal schools. The University is not a large factor here, as her graduates are taken higher up, and this class of teacher (mostly from small colleges or normal schools) often does grade work also.

3. The statistics for the total number of high-school teachers in the state and the distribution of graduates, and the utter lack of any sort of adequate preparation for their work on the part of some of them, still show the demand for college training wherever possible.

4. The deadening conditions of teacher standards for the lower schools can mean but one thing—that some type of institution must bend itself to a long and careful study of the whole problem. At present the following policy seems to be a feasible one for adoption in Kansas, entirely aside from, yet consistent with, our theoretical position already reached:

Let summer county institutes and normal-training high schools devote their efforts to the 8,000 very poorly prepared elementary- and rural-school teachers. That is, as a temporary measure, let our high schools be also (though of course inadequately, due to the age of the student) rural-teacher training schools. Let our normal schools work out the problems (a century's good solid work) of the grades, *administrative*, *supervisory*, and *pedagogical*. Here is a class already representing nearly 4,000 teachers. And in Kansas it should be remembered that there is but one real city training school to train even a part of its elementary-teacher force (Kansas City, Kan.). The University with help from the colleges would then work intensively upon the secondary problem, representing a field with about 300 superintendents, as many principals, and 1,100 high-school teachers. The other function of the University

School of Education would be the increasingly urgent one of carrying on, in connection and co-operation with the Graduate School, research work and full and extended investigations into modern educational problems, using the schools of the state and our own training school as genuine educational laboratories for those of the mature students who can aid in working constructively toward advancing the cause and profession of education.

There is no architecturally well-defined state school system. The statistics above seem to suggest some such economic division of labor as I have noted. The following quotation from the *Fifth Annual Report of the Carnegie Foundation for Advancement of Teaching*, pp. 76, 77, represents what should be expert opinion on the subject:

On the other hand, there can be no denying the fact that hitherto the normal schools in most states have failed to live up to their responsibilities in the matter of adequate academic standards and respect for the field of the high school. In many cases the courses in normal schools are mere reviews of courses already taken in elementary schools or in college. A few remarks on the method of teaching do not elevate these courses to the level where they can be fairly accepted by the colleges for credit when later the graduate of the normal school makes application for admission to the university.

Furthermore, the widely varying work undertaken by the normal school in different states shows how uncertain is the estimate of its function. Throughout the Middle West one finds normal schools offering the equivalent of the full college curriculum and conferring the Bachelor of Arts degree. The normal schools of other states are engaged in the work which properly belongs to the elementary school or the high school. In this latter case the normal school becomes an active competitor with the elementary schools and high schools, a result most disastrous to the educational interests of the people. These schools are direct competitors of elementary and secondary schools, and their effect is to discourage the development of good high schools. *Rarely have the normal schools devoted themselves effectively to their most urgent work—the training of teachers for the elementary schools.* [Italics mine.]

THE RELATION OF NORMAL SCHOOLS TO DEPARTMENTS AND SCHOOLS OF EDUCATION IN COLLEGES AND UNIVERSITIES

ELMER E. JONES

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The development of interest in the scientific study of education during the last decade is little less than marvelous. Education is regarded by all today as one of the most complex problems that confronts the human mind. It is all the more difficult at present because of its multiform tendencies and its variable content. It is not surprising, therefore, that scientific method has been applied to it, and that in recent years we have seen much evidence that a real science of education is no distant achievement. This scientific attitude toward the problems of education is reflected in the whole organization from the kindergarten to the university. In every phase of education there have arisen clear and distinct problems which must be solved, not in the easy arm-chair fashion of the old-time writers, but by experimentation and exact measurement. These problems must be solved by individuals trained in their respective fields for such research, and these researches must bear the stamp of approval by practical educators.

This scientific attitude toward all phases of educational work has had a marked effect upon the institutions devoted to the training of practical educators, viz., normal schools and schools and departments of education. The former today are working out problems in experimental pedagogy, shaping ideals in elementary education, studying the problems of the training of elementary teachers, and giving the state a type of teacher far superior to what has been known previously. The recent development of schools and departments of education in colleges and universities is a new manifestation of the scientific interest in the larger problems of education, which are of such a character that normal

schools cannot adequately meet them. The more advanced study of education in recent years has brought about the necessity for facilities of research that can be met nowhere to better advantage than in the higher institutions of learning. That these departments have generally evolved out of departments of philosophy and psychology and have now gained an independent position in the organization of colleges and universities is sufficient proof that the advanced study of education is a felt need, and that this need must be met by strong courses correlative with important subjects in other fields.

This scientific awakening has had a reflex influence upon the teaching process. Child psychology has revealed many errors in the older pedagogy, and the modern teacher has had to make a complete readjustment to the new point of view. The curriculum of study has been largely reconstructed and is still in process of reconstruction in harmony with the most recent educational investigations. But when we touch the teaching process we touch the teacher also, and the institution which trains her. It is thus that the normal school has been greatly modified by this newer conception of the importance of definite information concerning the teaching process. This is shown by the marked improvement in the personnel of their faculties, which are no longer regarded as dumping-grounds for worn-out school ma'ams and superannuated school superintendents; but native endowment, special preparation, scholarship, and research ability are regarded as prerequisites without which they cannot hope to be in a position to train teachers. This point of view, together with a better scale of wages for normal-school instructors, has enabled the administrators of this sort of education to secure efficient, scholarly workers, and to give us some of our most fruitful researches in recent years. It is no longer deemed beneath the dignity of the trained scholar in education to devote himself to the scientific study of the elementary problems, which is clearly the field of the normal school.

In discussing the relationship that maintains at present between normal schools and schools and departments of education in colleges and universities it is necessary to look briefly at the development of each historically. Normal schools have a long history

which might be traced up through the educational work of the Jesuits, the ideas of Luther and Melancthon, and the later educational reformers, as Comenius, Rousseau, Pestalozzi, and others. In this whole evolution, the movement is obviously directed to the solution of the problems of elementary education. The history of the movement is a struggle to work out the problem of the training of teachers for the elementary schools. Throughout the Middle Ages elementary education had been neglected, but modern reformers stated in no uncertain terms that one of the needed elements in the symmetrical development of the race was the correct training of children. This need was emphasized so strongly that many institutions sprang into existence with no other function but to study the child and develop methods by which he might be taught successfully the curriculum then in vogue. They came to be called normal schools because they were in harmony with the new philosophy of naturalism, and because in the methods employed the normal bent of the child was considered first of all in applying to him any method of instruction whatsoever. The normal-school movement in America has been decidedly Pestalozzian in character, with but few exceptions. Historically they were established for the reason that it had become evident to Americans that there were certain definite facts in elementary education which should be known by teachers undertaking the task of training youth. Normal schools from the beginning in America have undertaken as their problem the training of elementary teachers. This was in the beginning a clear and distinct field, and remains so at the present time. There appears to be no other field of educational thought and activity at present to which they may with true economy apply themselves. And the field should not be regarded as narrow, or small, or unimportant. Indeed it is probably the most important of all fields, being fundamental to our whole superstructure.

I would indicate some of the important fields for investigation, which appear to me to belong logically to the normal school, though I would by no means limit these fields to the normal schools. It is possible that in some instances there might be better facilities for such investigations in the colleges and univer-

sities. First of all, there is the whole field of method as applied to the instruction of youth. There is great opportunity in the normal school for careful scientific investigation of method, not of the "do-and-do-not" sort, but of the sort which has for its basis a more thorough understanding of the child mind and its growth and development, and of its adjustability to varying stimuli. The normal school can do this work better than any other institution because it has its training school and school of experimentation expressly for this purpose. Indeed we look to the normal schools of America to take care of the problem of method in elementary education. Second, no institution is better fitted to give us information concerning child growth and development than the normal school. Here is one of the largest and most important fields of investigation in education today, and yet how few of the normal schools are devoting themselves to it. But they are especially adapted to this work because they have supervisors of instruction and the same pupils year after year in their training school, and thus have opportunities for investigation in growth such as are afforded to no other educational institutions at the present time. It seems especially desirable that normal schools encourage research in the whole field of child-study and development, because it justly belongs to them, and also because no such opportunities are afforded elsewhere. Third, there is no institution which is so well equipped to initiate the novice into actual practice of teaching children as the normal school. Here is their clear and distinct field. There is no danger of it being encroached upon so long as the work pertains to elementary schools. This is the special thing that makes the normal school a purely technical institution. In this regard it should take its place right along beside the other technical schools of our age. It is the function of the normal school to fill in this important niche in the great scheme of education. The state is interested in the education and general intelligence of all its citizens. To this end she founds and maintains a public-school system at great expense, every unit of which is directed by a teacher. The normal school in its function of preparing all these teachers for their duties becomes at once the very heart and center of the system. No institution has so great an immediate responsi-

bility as that of the normal school, because its graduates are set at once to the task of teaching children—developing childhood for the great complexity of adult life. It should be said that the evolution of the normal school in foreign countries has been similar to that in America, and there too, such schools are sponsors for the solution of the problems of elementary education.

There may be situations in certain states wherein it is wise for the normal school to undertake the training of secondary teachers. But it would seem preferable to do a minimum of such work. Secondary education is fast becoming a highly specialized work, adapted to the needs of the adolescent, and differing as much from elementary education as does vocational training from the training of the humanities. Indeed there is little in common, from any point of view, in elementary and secondary education, if both are fully adjusted to social, physical, and psychological aspects of students in the two classes. Skilful teachers in the two fields of work cannot successfully exchange positions. Knowledge of child life does not mean knowledge of adolescent life, nor vice versa.

Departments and schools of education have arisen in almost all of our colleges and universities, because there is a generality of opinion that the problems of education form a well-defined field of thought and investigation, whose complexity and difficulty may very well merit the attention of the best thought and research. Such fields of investigation as school administration, school organization, philosophy of education, history of education, educational psychology, foreign school systems, and orthogenics, may very well rank with other college and university subjects, either from the point of view of general cultural value, or the point of view of professional training. Departments and schools of education incorporate in their curricula bodies of knowledge as extensive and as profound as are to be found in other similar departments, such as law, philosophy, or medicine. The practical problems considered are certainly as rich in significance as those to be found elsewhere. For example, it is as complex and difficult a problem scientifically to superintend a large city system of schools as to be governor of a state; yet, until recently, it has not been deemed necessary for the city superintendent to have the broad scholarship and the

professional training that was expected of one who looked for gubernatorial honors. Departments and schools of education furnish opportunity for men of ability and training to make investigations in every field of education. They should investigate the larger point of view of the problems, but should encourage detailed researches and studies of every sort. There should be no limits placed upon the investigations carried forward, and it thus becomes apparent that from this source we must look for the solution of the more difficult and complex problems of education.

The field of secondary education alone is now reaching out into such vast proportions, and the professional training for such work is becoming so comprehensive, that it can only be furnished adequately by colleges and universities that are fully equipped with library and laboratory facilities for study on a par with the academic standards maintained in other departments.

The relationship existing between normal schools and departments and schools of education is thus rather clearly defined. Each has its own special field of work, which, of course, is not ironclad, and never should be, but which is a product of evolution and no arbitrary mechanism. The normal school has evolved in America and in foreign countries because educators felt the need of definite and specific training for teachers in the elementary schools. Here is the great function of the normal school, and its field is large and profound enough to engage the best thought of our best scholars. Schools of education in connection with colleges and universities should supply the proper amount of professional training to those who are regular students of other departments, and who may wish to teach. They should also furnish opportunity for research in every possible field of educational work, from the kindergarten to the university itself, in order that progress may be scientific and free from worthless fads. Thus, there is no conflict between the normal school and the department of education. The work of each is clearly defined historically and functionally, and at present each is doing that for which it is intended in the solution of our very complex educational problems.

UNDERGRADUATE DEGREES IN EDUCATION IN VARIOUS COLLEGES AND UNIVERSITIES

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According to the *Report of the Commissioner of Education* for 1910, 176 universities and colleges are offering courses in pedagogy. In some of the larger universities (for example, the University of Chicago, Columbia University, the University of Iowa, the University of Illinois, the University of Kansas, the University of Minnesota, New York University, the University of Wisconsin) the pedagogical work is given by a division of the university and consists of a four-year course leading to the A.B. or B.S.

In by far the larger number of colleges, however, the courses in pedagogy are offered by a department and constitute simply a group of elective studies which may be taken as a whole or in part, toward meeting the requirements of the college degree.

The first chair of pedagogy in the United States was established in the University of Michigan in 1878. In this connection it is interesting to note that when New York University was founded in 1830 it was proposed to establish a professorship of "The Philosophy of Education and the Instruction of Teachers." In 1890 the School of Pedagogy of New York University was established as "a professional school of equal rank with the other schools of the University." It was the first professional school of university grade for the study of pedagogy, in distinction from lectureships and professorships of education, established in this country. In 1903 the School of Pedagogy was placed on a graduate basis, and only graduates of approved colleges are now matriculated as candidates for its degrees.

The tardy recognition by colleges of the importance of pedagogy is due largely to the belief, still surprisingly prevalent among college professors, that the mastery of a subject carries with it the ability to teach the subject, all pedagogical study being therefore

useless or worse than useless. The falsity of this theory is now generally accepted, even in collegiate circles, and I believe the time will soon come when our graduate schools, which are all largely professional schools for the training of teachers of collegiate subjects, will not merely admit pedagogy to the graduate rating, but will actually make the study of pedagogy a requirement for advanced degrees. The Ph.D. will then stand not only for the mastery of a subject, but also for some acquaintance with the principles and methods of teaching it.

The requirements for an undergraduate degree in education in a School of Education, School of Pedagogy, or Teachers College are in every case the completion of a four-year course, the subjects studied being divided about equally between purely collegiate courses, designed to give the student a satisfactory knowledge of the special subjects he expects to teach, and the professional courses, consisting of the history and philosophy of education, psychology ("pure" and applied), principles of education, general and special methods (including observation and practice teaching), school organization, administration and supervision. Great freedom of choice in the selection of both collegiate and professional courses is generally permitted. The selection of the subject-matter for collegiate courses is determined with the view to future teaching, a student being commonly required to present one major and two minor subjects each in a separate department or group. The required professional courses usually include only the history and principles of education and psychology; the rest of the professional work is determined by the needs of the individual students. In general, however, he is required to concentrate his attention on some special department of educational work. This is accomplished either by requiring the dean to give his approval to each selection of courses, or by arranging the courses in related groups, for example, teaching in secondary schools, elementary schools, kindergartens, and technical subjects, one of which must be completed by the student.

The departments of education show very little uniformity of organization. The courses are frequently given by a single professor or lecturer, whose personal inclination will determine the

subjects offered. In some states, as New York, Iowa, Wisconsin, a college graduate must complete certain courses in order to receive a state certificate. The state requirements then become the important factor in determining the courses offered in the pedagogical department. The Department of Education of the State of New York established in 1905 the following course of study for the college graduate professional certificate:

Psychology (general and educational)	60	hours
History of education and principles of education	90	"
Methods of teaching	60	"
Observation	20	"

This course of study and the syllabus was prepared for the department under the advice and co-operation of the following committee, at a conference of the colleges and universities of the state: Dean Thomas M. Balliet, chairman; Dean James E. Russell, Professor Charles DeGarmo, Professor J. R. Street, Professor W. H. Squires, Howard J. Rogers, Augustus S. Downing.

A study of the courses offered by the different departments shows such a diversity of subject-matter and of method that I feel justified in suggesting at this time the advisability of establishing a certain standard course in education as a minimum requirement for the undergraduate degree in education:

1. Educational psychology, that is, the elementary study of the mental operation involved in the educative process.
2. General principles of education, history of education, and general method.
3. Special methods and devices combined with at least one term of observation.

This minimum requirement of study combined with the study of collegiate courses dealing with the subject-matter to be taught will give the college graduate at least some preparation to meet the immediate problems of the classroom. To these minimum requirements might be added, if time permitted, a brief course in the history of education, covering simply the modern educational reformers. The usual course in the history of education is of little practical value to the college student during the first year of teach-

ing. Of course, a complete study of the history of education is necessary for all advanced graduate work in pedagogy. There should also be added to the minimum course, if possible, a brief course in class and school management, omitting all discussion of school administration, comparative school systems, etc., as these do not touch the problems of the young teacher.

The college students who do not look forward to teaching as a profession should be encouraged to take general cultural courses in education to give them an appreciation of the bigness of the problem and to prepare them to act intelligently on educational matters, but such courses would have no direct bearing on the work of the teacher. In this group, I would suggest educational reformers, comparative school systems, and the philosophy of education.

These suggested courses are offered in order that there may be a general discussion and eventually a general agreement among us as to what shall constitute the minimum requirements for a professional course in education, and in order that we may ultimately bring about the standardization of these fundamental courses in education.

UNDERGRADUATE DEGREES IN EDUCATION IN
VARIOUS COLLEGES AND UNIVERSITIES
OUTLINE OF A COURSE IN SCHOOL HYGIENE

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It seems advisable for the discussions of Professor Lough's paper to deal specifically with one or two of the courses in education, rather than with his summary of the general requirements for degrees. This Society sooner or later must reach an agreement, not only as to the types of courses required, but also as to the detailed content and method of these courses.

I have taken the liberty, after conference with Professor Lough, of limiting my paper to the course or courses concerned with the health phases of education. My special purpose is to make an appeal for the requirement of a course in school hygiene, covering at least ten weeks with three class hours a week, for all degrees in education. The need for such a requirement has been forced upon me in seven years of study and campaigning, as I have become more and more astonished at the ignorance or neglect, by teachers, principals, superintendents, and even professors of education, of the child's health as the basis of education, happiness, and success.

To argue before this Society for the hygienic care of the school child would be superfluous, even if I had the time. You would readily agree with me (1) that health is the first consideration of education; (2) that many conditions in our schools do not promote but even militate against the healthful development of childhood; (3) that other problems must not crowd to the rear those immediate ones arising out of these conditions; and (4) that the most effective way to make the advances now demanded by health considerations is to educate our present, and especially our future, teachers of all grades in the importance and in the practical methods of school hygiene. It behooves me, therefore, only to outline a tentative course that might meet some of the present needs.

The field of school hygiene may conveniently be divided into six divisions:

- I. *Inspection for contagious diseases.*—The responsibility for this work falls upon the medical profession, as laymen run great risks in, and teachers should be discouraged from, attempting differential diagnoses of disease. However, the teacher and principal bear a part of this responsibility, even in cities where doctors and nurses inspect all the children, because the early detection of symptoms and the prompt reporting of suspected cases by the teacher or the principal are necessary safeguards to the child and the community. This responsibility of the educational staff is far greater in towns and rural districts where principals and teachers take the place of medical inspectors and nurses in referring the child to his family doctor. It is essential, therefore, that the future teacher be instructed in the aims and methods of medical inspection and in the evident early symptoms of children's diseases.
- II. *Inspection (and treatment) for developmental defects.*—In this division are included errors of refraction, defective hearing, adenoids, enlarged tonsils, decayed teeth, defects of posture, nervousness, malnutrition, etc. Here the responsibility is about evenly divided between the educational and medical professions, except in the few cities with complete systems of medical inspection. The teacher has shown his ability to use the test cards for eyesight and the whisper or watch test for hearing, not to find out what is the matter in defective cases but to learn that something is the matter. The adenoid and tonsillar obstructions to breathing may be detected by the trained teacher, certainly in the advanced cases; the teeth can be inspected by him if there is no dentist or doctor to do so, and he bears, along with the parents, the responsibility for making the care of the teeth a part of the pupil's daily routine; the defects of posture, nervousness, and malnutrition need a physician only in extreme cases, while both home and school must daily give all cases the needed watch-care and guidance. Under this division comes also the proper direction of pubescent pupils in all their school and home activities. Altogether, it may be said that a teacher who knows not the significance of developmental defects, their more evident symptoms, and the simpler phases of treatment has not been well prepared by his normal school or college.
- III. *Hygiene (or sanitation) of buildings and equipment.*—Here we have a division without a sponsor. The doctor, unless he has had exceptional training, knows little about it; there are painfully few architects who understand it; and educators have often satisfied themselves with showing the mistakes made by boards, architects, and contractors.

The educational profession must be held responsible for this division, with the aid of the architect, the sanitary engineer, and the doctor. We must know and teach the hygienic requirements for water, lighting, ventilation, heating, cleaning, toilets, seats and desks, blackboards, etc., until the knowledge of them controls the building, repairing, and furnishing of nearly all schoolhouses and also controls the daily use of the building and equipment by teachers and principals.

- IV. *Hygiene of school management.*—In this division are included such topics as the one- or two-session day, the length of the school day for each grade, the length of the recitation periods by grades and by subjects, the alternation of recitation and study periods, the time of day for the more difficult subjects, the time and use of recesses and relaxation periods, luncheons, home-study, hygiene of discipline, keeping-in, hygiene of methods of teaching, etc. The relations of this division affect every part of school work. That we have evolved so few principles to guide us here, other than traditional and empirical rules, is not to the credit of our profession.
- V. *Exercise, play, games, and gymnastics.*—Here we have the division of physical education in the narrow sense. In a few city systems this work will be carried on under specialists as directors, but for the most part principals and teachers will bear the responsibility for it. They should learn, therefore, the main subdivisions of physical education and their hygienic aims and methods. It is surprising how many cities and counties and even entire states have as yet been untouched by the revival in physical education, awaiting trained principals and teachers to awaken them. Intelligent interest in and enthusiasm for all-round physical education should be kindled at our normal schools and colleges.
- VI. *Teaching of hygiene in elementary and secondary schools.*—There is some promising unrest in this division, coming mainly from educators who see the futility of our present content and method. Doctors may help us here a little, but we will have to work out our own pedagogical salvation in this subject. The school must aim at the daily living of the pupil, rather than at verbal knowledge—must aim to make him a different child in the activities that affect health and morals. Teacher and principal, through all the agencies possible, should make him understand and desire correct living, not only for himself but also for his home and his community. Every school teacher, no matter what else he teaches, should be a teacher of hygiene, for such teaching should be brought in, now here, now there, whenever the opportunity arises. Hygiene—personal, domestic, civic—should be the background subject of all the courses in the elementary and secondary curriculum, and all teachers should be prepared to teach its essentials.

The above mention of the six divisions of school hygiene may serve as a tentative outline of a college course in the subject. This course might be given by itself or might be part of a general course in the principles of education, school management, or school administration. As the field is really too large to be covered in ten weeks, the course could well extend through a full semester, with a second course for advanced study; or it might be divided between two general courses, as mentioned above. Under any plan, ten weeks' instruction in school hygiene should be required of every candidate for a degree in education. As the American textbook material for such a course is fragmentary, two or more different books might be used by different students and parallel reading should be emphasized. It is fortunate if the student can approach the subject with some knowledge of general hygiene and also of organic evolution. The professor can enrich the course with references to the little that is known of the anatomy, physiology, and pathology of growth and to the necessity for safeguarding and promoting special phases of development at each stage. He should strive to make his students apostles for the child's health, ready to practice the right and even fight for it.

UNDERGRADUATE DEGREES IN EDUCATION IN
VARIOUS COLLEGES AND UNIVERSITIES
THEIR ACADEMIC AND PROFESSIONAL REQUIREMENTS

ANNA JANE McKEAG
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It is possible that the makers of the program of this session of the National Society of College Teachers of Education intended to designate by the term "undergraduate degrees in education" only such degrees as are conferred by institutions organized as schools of pedagogy or teachers' colleges. Professor Lough has, however, interpreted the term as including also the ordinary baccalaureate degree in colleges where the requirements for the degree may be met in part by courses in the department of education, and I shall therefore use the term in this less restricted sense.

In the first place, let me express my cordial agreement with Professor Lough's statements as to the great need for standardization of schools of education, departments of education, and courses offered within these schools and departments. The general movement toward standardization is one of the most significant educational tendencies of the present day, and we need but to reflect upon the number and strength of the agencies working toward this end to realize the importance of the movement toward what Chancellor Elmer Ellsworth Brown terms "institutional coherence." The Bureau of Education, the Association of Collegiate Alumnae, the Association of American Universities, the Carnegie Foundation for the Advancement of Teaching, the National Association of State Universities, and the National Conference Committee on the Standards of Colleges and Secondary Schools—these are but a few of the organizations at present interested in the standardization of higher institutions of learning. It may reasonably be expected that within a few years these activities will result in the establishment of academic norms which shall have wide acceptance.

The benefits of the tendency toward standardization are being felt also in special departments. Much of the improvement in the teaching of English is to be attributed to the efforts of organizations of teachers of English to bring about greater uniformity in subject-matter and processes of instruction.

Departments of education will profit greatly by a similar attempt at standardization of requirements and courses. Such standardization can be brought about only by concerted action among those of us who teach education. The requirements of states and cities for the certification of teachers are at present in too formative and crude a stage to be of much assistance to us in this effort after uniformity. Our National Society of College Teachers of Education, in its reports and discussions of courses in the history of education, educational administration, principles of education, practice teaching, and observation in schools, has done much toward clarifying the principles which should guide us in the establishment of standard courses. The New England Association of College Teachers of Education has for seven years been carrying on a similar work, and has devoted each of its annual meetings to the discussion of the content and method of one of the courses commonly offered in education. It may be of interest to know that the New England Association is at present at work upon a "Reading List in Education," which may indirectly contribute to greater uniformity in the content of courses. It is possible that a committee appointed by our National Society might do a valuable piece of work in the direction of standardization of courses.

Indeed, until there is greater uniformity in the content of the chief courses offered in departments of education, all discussion of the minimum requirement for degrees in education seems rather profitless. Our present practice in nomenclature is so loose that the course in "Principles of Education," for example, may in one college consist largely of material which in another college is given under the title, "Philosophy of Education," and in another under the name, "Educational Psychology," or even "School Hygiene."

The one marked exception to the vagueness of terminology to which I have referred is to be found in the case of the course in

the history of education. This course, at least, is fairly well defined and is decidedly the most thoroughly organized of the courses commonly offered. It is, perhaps, the course which obtains most easily the academic recognition of college faculties. It gives, moreover, to the student a professional outlook which is of the greatest value—a feeling of the dignity and importance of the teaching profession and a kind of orientation in the profession which are of the greatest value. I should assign to this subject, therefore, considerably more importance than does Professor Lough in his statement of the minimum requirements for a degree in education. I do not believe that the criterion in the determination of these requirements should be in all cases that of the “practical” in the popular sense of this term. There is great danger that in yielding to the demand for the immediately useful in education, we may fail to give proper emphasis to those subjects which contribute most to breadth of view and intelligence of attitude on the part of prospective teachers.

The course in educational psychology, as given in most colleges, overlaps that in principles of education: perhaps it is desirable that this should be so. The two topics, among those commonly treated in courses in educational psychology, which seem to me to present the most highly organized body of material and to be at the same time the most valuable to the prospective teacher are: (1) individual differences, and (2) the various associative processes, such as habit, memory, and the apperceptive processes. A good preliminary course in general psychology seems to me a desirable prerequisite to the study of both of these subjects, and I should add such a course to the minimum requirements as stated by Professor Lough.

The place of the study of general method in undergraduate courses presents peculiar difficulty because of lack of material at present available in this field and because of the chaotic state of educational opinion on this subject. It is to be hoped that in the next few years the contributions of educational psychology and experimental pedagogy may be studied in the light of the educational practice of expert teachers, and that there may result a more authoritative body of material in general method than we now possess.

Our present educational assets in the domain of special methods seem to me to be more valuable than in that of general method. The number of good books in this field is rapidly increasing, and the educational periodicals contain much that is of value.

I agree with Professor Lough in his inclusion of a term of observation work as one of the requirements for a degree in education—observation, however, that is carefully directed to specific ends. There is still a great deal of difference of opinion as to the expediency of giving practice teaching to undergraduates. In colleges which are not distinctly teachers' colleges, it is extremely difficult to make the adjustments necessary for such practice. In such colleges I believe that practice teaching may be done under better conditions if deferred to a graduate year.

In colleges which offer any considerable number of courses in education counting toward the baccalaureate degree, a course in secondary education should be a part of the minimum requirement for any kind of certification of graduates for teaching positions. The majority of our college graduates who teach go into the secondary schools. These schools present problems widely different from those of the elementary schools. A course in secondary education should include a study of the development of the American high school, a study of the fundamental principles underlying the education of adolescents, a study of the organization and curriculum of one or two typical high schools, a study of the special methods of teaching at least one high-school subject, and observation of the work of skilled teachers.

THE PRESENT STATUS OF EDUCATION AS A SCIENCE

THE PROBLEM OF EDUCATIONAL PSYCHOLOGY

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In the recent criticisms of education as a science, educational psychology was particularly singled out as "a pretentious humbug that has grown like an excrescence on the body educational." It would be an unprofitable and uncongenial task to examine whether educational psychology has a distinctive field and a specific problem and to inquire whether it has to offer "a body of definite facts and established principles which are not accessible to trained observation and common sense," or which are not already presented in other sciences, merely because an epidemic of *rabies paedagorum* has broken out in certain quarters. These modern Philodoxes may be referred to the sage counsel of Marcus Aurelius, "If thou art pained by any external thing, it is not this thing that disturbs thee but thy own judgment about it." No serious student of a science can have failed in his leisure moments to consider the larger value and significance of his field of work. The educational psychologist has endured in his own mind this probation and when the occasion is imperative is prepared to give an *apologia pro vita sua*.

The growth of departments, schools, and colleges of education, the rapid increase in the number of courses in which the accumulating results of investigations in education are to be presented to the prospective teacher, the constant shifting of the boundaries of the science, do raise real questions as to the proper organization and subdivision of its material for purposes of instruction and training. This problem is particularly insistent where a department or school has a number of men giving courses in education. Probably the most natural subdivision of the field is into (1) administration and supervision; (2) history of education; (3) principles and methods; and (4) psychology, including general, genetic, and social psychology, child-study, and educational psychology.

Under any division of labor there is likely to be some overlapping, and this is particularly true with principles of education, principles and methods of teaching, and the various forms of psychology. Delimitation and demarkation of fields within any science is a barren task and does little or nothing to advance it. For purposes of presentation of its facts coherently and systematically and in such form that it may be of the greatest service for practical use and guidance, however, the organization of material is an important concern. Indeed, the significance of form and method, in addition to subject-matter and content, is just what pedagogy has been insisting upon so vigorously for many years.

In none of the divisions of education is there greater difference of opinion as to its aim and subject-matter than in educational psychology. An inquiry sent out to some of the larger institutions in which educational psychology is offered revealed a very great diversity. In most institutions it is given as an undergraduate course with general psychology as a prerequisite, in some it may be taken as a first course in education without general psychology, in others, general psychology is followed by genetic psychology or mental development, educational psychology being offered as an advanced course. The articulation of educational psychology with general psychology in many institutions presents a difficult problem. When general descriptive psychology is given in different sections and by different men, representing diverse points of view, one emphasizing the functional, another the structural points of view, one devoting a large part of a one-semester course to the nervous system, sensation, perception, and the image, another giving the major part of the time to the higher mental processes, one laying stress on experimental data, another on the results of unaided introspective analysis, the problem for the instructor in an undergraduate course in educational psychology is not an easy one. This is the situation in many of the universities in the country. In a few institutions, e.g., Teachers College, general psychology is given in the department of education and the educational psychology is closely articulated with it.

The variation in content of the courses is very great. At least five types of introductory courses, called educational psychology, can be distinguished:

1. Principles of teaching based on psychology, in which psychological conceptions are applied to educational practice. Concrete and practical problems arising in school work are interpreted in the light of psychological principles.

2. Psychology of the various school subjects—an analysis of the mental processes involved in reading, writing, spelling, arithmetic, etc., with the practical applications to teaching.

3. Selected topics from genetic psychology and child-study, with a view to tracing in broad outline the normal mental development from childhood to manhood.

4. Selected topics from general psychology which are treated in greater detail than in the general course with specific application to school practice. This course differs from the first type by the greater emphasis on psychological facts than on their application to the art of instruction.

5. Psychology of learning—an analysis of the various forms of learning and the factors conditioning the learning process.

This classification is admittedly rough, but indicates that educational psychology obviously means rather different things in the different institutions. In view of this state of affairs it is profitable to examine what knowledge of psychology is of the most worth to the teacher and what might legitimately be included under educational psychology.

It has long been insisted that a knowledge of psychology is a necessary part of a teacher's equipment. Such knowledge was supposed in some mysterious way to render his work more intelligent and efficient. Psychology was held to be related to education somewhat as physiology is to medicine, or as physics to engineering. General psychology came in time to be an almost universal requirement for certification. The difficulty of applying general psychological principles derived from analysis of the adult consciousness to the training of children, and the inability to derive from them genuinely useful pedagogical prescriptions, ultimately bred a skepticism of its value, a skepticism shared by both teachers and psychologists. James, for instance, said that, "As the most general elements and working are just those parts of psychology which the teacher finds most directly useful, it follows that the

amount of this science which is necessary to all teachers need not be very great. . . . It might almost be written on the palm of one's hand." Just as neither a knowledge of physics, nor merely pointing out possible practical applications of physics, will be especially useful to the engineer confronted by a specific problem, so will neither a knowledge of psychology, nor merely pointing out possible practical applications here and there in school practice, help the teacher much. The result of this attitude was that instead of a direct knowledge of psychology the fundamental conceptions of psychology were presented in manuals of method and psychologies for the schoolroom, in which practical rules supposedly deduced from psychology and simplified for practical guidance were supplied. As a matter of fact, these rules of procedure were not deduced from psychological laws at all but were the outcome of successful practical experience interpreted in psychological terms. Those to whom this fare was unpalatable patiently studied general psychology in order to understand what processes were involved in acquiring and organizing experience and relied on actual observation to build up a practical psychology of how to regulate the acquisition and organization of experience in the minds of pupils. Theoretical and practical psychology had little or nothing to do with each other.

The rise of child-study and genetic psychology shifted the interest from the introspective analysis of mental processes to the natural history of mind in its changing stages of development. Since it is the task of education to guide the progress of the child aright from one stage to the other it was insisted that the teacher should not only know the nature of his own mental processes but should also be acquainted with the evolution of mental life in the child. In fact, this was regarded as just the psychological knowledge which he needed to become an "artist in the souls of children." Extravagant hopes were entertained as to its immediate practical value for education. Courses in genetic psychology or child-study either took the place of general psychology or were added to the required pedagogical curriculum. However, a scientific knowledge of mental development in all its stages of growth, of the dominant capacities, needs, and interests of each period of child life, is a large

order. It is needless to say that this is a science of the future. As Dewey says, "No one has a complete hold scientifically upon the chief psychological facts of any one year of child life." The result has been a complaint by teachers that while the knowledge of mental development enabled them to criticize existing conditions, it was not particularly helpful either in the construction of courses of study or in selecting modes of presenting subjects. It was a step nearer the teacher's problem, but still it did not meet his needs.

It is out of this need that educational psychology as an intermediary between psychology and the art of teaching has arisen. Educational psychology in its widest sense embraces the study of those phases of mental life that concern education. It would thus include pertinent facts from general, genetic, social, and individual psychology. Does it, however, not have a more definite and specific field of its own?

If we define education in its simplest terms as the process of bringing an individual from where he is to where he ought to be, its three main problems emerge:

1. Where he ought to be—the end or aim of education—is the problem of principles of education to be worked out for the various types of schools and curricula and for the various periods into which mental life falls.

2. Where he is—the nature of the individual at every stage of his growth—is the problem of biology, sociology and psychology, general, genetic, individual, and social.

3. How he is to be brought from where he is to where he ought to be, gives the problems of methods of learning, on the one hand, and means and methods of teaching, on the other. Educational psychology seems to be legitimately concerned not with the second problem but with the third. Its essential field is methods of learning, especially during school years and under school conditions. It is not identical with principles of teaching, on the one hand, though these would be based on educational psychology, nor, on the other hand, do its problems arise in general or genetic psychology. How does the pupil acquire the experience which society deems necessary most accurately and completely? How does he learn

most economically and effectively? What are the factors conditioning the process?

The problem of educational psychology is distinctly different from that of general or genetic psychology. Each has a common object—the knowledge of mind and its laws—but the point of view is different. To borrow a distinction made by Messmer, psychology is concerned with mental processes, educational psychology with mental work. Psychology studies the natural activity and development of minds, educational psychology studies the activity and development of mind when it is definitely directed to the attainment of certain ends. The one studies the processes that are involved in natural, undirected learning, the other the way in which these processes operate most economically and effectively when directed to the acquisition of the experience embodied in the curriculum. Systematic, constrained mental performance differs radically from spontaneous, uncontrolled activity both in its methods and results. Psychology studies the nature and forms of association; educational psychology the best and most economical methods of forming the associations demanded for a mastery of the knowledge which experience has shown to be most useful and most essential. Psychology asks what the processes in the formation of concepts are; educational psychology not so much how they are formed as the best and most economical methods of securing clearness and accuracy in them. Psychology analyzes the nature of attention, its kinds, laws, and conditions; educational psychology, the conditions of securing and retaining attention of children in school and when directed to school subjects. Psychology studies the nature and causes of mental fatigue under various conditions; educational psychology is interested in fatigue produced by the school and its work. That educational psychology has here an important field for investigation is shown by the recent studies of methods of learning both by adults and by children. Waste in education appears to be due more to inefficient methods of learning than to inefficient methods of teaching.

The art of learning is nowhere adequately taught, though it is the most valuable art one can acquire. Educational literature teems with books, monographs, and papers on the art of instruction.

In contrast to this wealth of material is the paucity of literature on the art of study. The learning process has not yet received the serious study it deserves. We know the processes only in broad outline from psychology. Beyond a certain point our notions are vague and nebulous, specific questions are unanswerable, and an adequate knowledge of details is entirely lacking. How do pupils learn most economically and efficiently? If there is a waste of time and energy how may it be eliminated? Does education have anything to offer as suggestions for improvement? No one, I venture to say, can give satisfactory answers to such apparently fundamental questions. To attempt to devise proper methods of teaching without knowing more about methods of learning seems futile. Efficient methods of teaching will be discovered when the problem of efficient and economical learning is solved, and only then.

Methods of learning have been left to the instincts of the child and he builds up the methods he ultimately comes to rely on by trial and error. Most of us "know by experience itself, that it is a marvelous pain, to find out but a short way, by long wandering." The discovery of this "short way" is the problem of educational psychology. Since the teacher's problem is, in part, at least, "to transplant knowledge into the scholar's mind as it grew in his own," an analysis of his own methods of learning is a first step. More than this he needs the generalizations that come from such study by many individuals and finally the knowledge that comes from actual experiments on school children under school conditions.

Educational psychology would thus have a specific problem of its own and would ultimately develop its own methods. For its purposes the psychological analysis of present methods of teaching and the reactions produced on growing minds is not sufficient, nor is the knowledge of laws of mental work to be based merely on laboratory experiments, though the studies of the laboratory will usually be the starting-point of investigation. They narrow the path of experimentation and point the way. Actual school experiments will ultimately be the basis on which the science will rest.

If the foregoing considerations are valid then the aim of a course in educational psychology is to focus attention of the prospective teacher not on methods of teaching but on methods of learning—

he is to teach children, not subjects; to divest the learning process of some of its strangeness and develop a sympathetic appreciation of its difficulties and their causes; to put at his disposal the data available on technique and economy in learning; to acquaint him with the methods by which laws of learning have been discovered and may be discovered, not so much that he may conduct such experiments himself as that he shall be able to appreciate intelligently the value and application of such studies; to develop the "psychological spirit," the habit of psychologizing and observing and rationally interpreting mental processes in the children he is to teach. Educational psychology is then not primarily concerned with furnishing prescriptions for teaching that will be practically helpful, though this would be its ultimate result. If science gives facts and laws, and if the arts give rules of procedure, then educational psychology belongs with the sciences.

The subject-matter for a course in the psychology of the educative process, with this dominant point of view, may be presented either with reference to the subjects to be learned or with reference to the different types of learning. It seems partly a matter of personal preference which method of approach shall be used. A systematic account of learning the various subjects would be valuable if experimental educational psychology of the subjects was sufficiently developed. Such a psychology is still in the making, and can most profitably be taken up in an advanced course. The approach to the learning process through the various forms of learning, illustrated wherever possible in school subjects, seems, in the present state of our knowledge, to be more fruitful. Satisfactory material here is meager enough, which is not to be wondered at. An educational psychology which rests upon systematic study and experimentation of the learning process is only in its beginnings. With some important data of its own it must fall back upon the contributions from general, individual, and experimental psychology. Many of the investigations in these fields have been made with specific reference to the educational problems involved.

No two men would agree upon the detailed content of the course, even if they agreed upon the general point of view. The writer can, therefore, only give in outline what he is attempting to work

out as an educational psychology and the topics included. A brief general survey of periods in the life of the individual, physical, psychological, and educational, seems a useful introduction to the course. This study represents an attempt to disentangle from the accumulated mass of literature on child and adolescent psychology the facts bearing on the nature of learning activities in the various stages of growth and the limitations they place on the educative process. While such a survey is necessarily general, when it is dominated by a specific interest in learning processes, it seems a convenient method of emphasizing genetic and dynamic conceptions and of stating clearly the specific problems that the educational psychologist has to face. Child-study and genetic psychology have brought home the contention of Stevenson that "to travel deliberately through one's ages is to get the heart out of a liberal education." This does not solve the problem but rather sets a problem to educational psychology as to how this can best be accomplished. The basis of learning and the foundation upon which education rests is the native equipment in instincts. Hence, the first step in the study of learning is to take stock of these unlearned reactions. The nature, characteristics, and classification of human instincts are quickly reviewed, to get at particularly the question of their modifiability. It is easy to say that we should utilize native tendencies that are useful and suppress those that are harmful, to work with Nature rather than against it, that "instincts furnish the educator with immeasurably his greatest opportunities"; but how is it to be done? The acquisition of new stimuli, the elimination of receptiveness to old stimuli, the acquisition of new responses, the suppression of old responses, and the blending of several instincts and their organization with reference to particular objects, have never been specifically worked out in very usable form for education. The modifiability of instinctive behavior in lower animals is far better known than in children. Hence an attempt to show, by means of experimental investigations or scientific observations, methods of modifying human instincts is no easy task, unless one is content to name the instincts and then add an appeal that they be utilized or suppressed. Beyond the obvious illustrations that occur to everyone it is hard to go with definiteness

and concreteness. The proper utilization of instinctive tendencies is still a matter of opinion and practice rather than of definite knowledge.

The trial-and-error method of learning in animals, children, and adults is analyzed and its operation in all stages of growth in connection with higher types of learning is pointed out. A more detailed study is made of learning through imitation and play. Imitation and play are regarded not as instincts but as innate tendencies which act as instinct educators. Their functions in the development of instincts and in the acquisition and interpretation of experience are worked out with reference to the problems of the school.

The work of the course to this point has been largely concerned with the natural, undirected modes of learning. The learning of the school is constrained, directed learning. It is guided by a specific purpose and imposed from without. Learning of this type is considered more specifically as mental work involved in forming associations between stimuli and mental state—technique and economy in observation—association between one mental state and another—technique and economy in memory and association—association between mental state and act—technique and economy in the acquisition of skill. The notable studies in these three fields have laid the foundations for a genuine educational psychology and for an art of study.

The technique and economy of observation is taken up first. Instead of discussing seriatim the psychology of sensation, perception, and apperception, the acquisition of experience is treated under observation, defined with Meumann as systematic, purposive perception with a view to retention. Educational theory and practice have emphasized since Pestalozzi the importance of training perception and observation. Object lessons and objective methods of instructions have been elaborated and have supposedly given this training. The experiments on description, *Merkfähigkeit* and *Aussage*, have shown the very great inaccuracies in perception and observation both in children and in adults, and have led to a re-examination of the processes involved with a view to determining the causes of the inaccuracies and methods of

improvement. To say that a child is an inaccurate observer because he lacks the proper apperceptive mass is not very illuminating and is but a cloak to our ignorance. To find the causes in the transformation of mental images, the specialization of memories, the lack of system and purpose in observation, inefficiency of sense organs, narrowness of the span of attention or of the memory-span, suggestibility, lack of motor activity with reference to what is observed, fluidity and fluctuation of attention, lack of supplementary ideas, practice and training, is to set problems of a technique and economy of observation for educational psychology.

The study of observation brings out the fundamental importance of attention for all mental work. Hence, the conditions in the nature of objects and the conditions due to heredity and past experience of the individual that determine clearness, the development of attention and attention-types, and the effects of attention are treated in their relations to learning. The outcome of attentive perception is the image which conserves the result. The different forms of imagery, the methods of determining image-types, and their relation to methods of learning and hence to methods of teaching are then systematically studied.

The technique and economy in memory and association, based on the experimental work since Ebbinghaus' studies, is reviewed rather fully in part for the results themselves and in part to indicate the methods of investigating problems of learning. While much of the work so far has been concerned with rote learning the methods can and will be applied fruitfully to logical learning. A child may be given a lesson to be mastered, an object to be studied, a poem to be memorized, an act of skill to be acquired. Some day we may be able to give him specific suggestions as to the best and most economical methods of attaining the desired end. The work that has been done on the factors involved in the formation of associations, in retention and in reproduction has led to a re-writing of the chapter on memory in the psychologies. The results of the experiments on learning by wholes and by parts, on distribution of repetitions, on retroactive inhibition, etc., represent the beginnings of a real art of study.

The technique and economy in the acquisition of motor control

and skill are similarly studied with reference to the experimental work since Fechner. The principles of efficiency in the combination and co-ordination of motor responses and their development in accuracy, rate, and simplicity, which have been established in learning telegraphy, typewriting, shorthand, etc., are related to the manual activities of the school in default of actual experimentation there. Curves of learning based on experiments with school children and in school activities are greatly needed.

Three important factors affecting learning are then singled out for systematic study—transference of training, mental fatigue, and individual differences. These factors should logically appear in connection with the types of learning. There are pedagogical advantages in a separate treatment and historically the numerous studies in each field have been undertaken as special investigations. The literature in each field is large, but adequate experimentation under school conditions is still to be done. Satisfactory school experiments on transference of training are almost entirely lacking, in spite of the importance of the problem and the perennial discussion of it. Reliable methods of measuring mental fatigue are yet to be secured, and the validity of most of the practical conclusions on fatigue in school children is doubtful. Individual differences in capacity to learn, in rate of learning, and the effects of equal practice on individuals are still imperfectly known. Here are problems that can never be solved by merely taking the by-products of experimental or other psychology and applying them.

The last part of the course is given over to the psychology of learning the various school subjects and the psychological methods of testing efficiency of results. The distinction between the methods of learning and methods of teaching have been interestingly brought out in reading and spelling and have shown the importance of an analysis of the learning processes before methods of teaching rest on anything but an empirical basis. We may teach reading by the word method, but the child may not be learning by words. We may teach spelling by certain methods, but children may be learning to spell by others. Method of teaching has systematized each subject for presentation. Method of learning on which the method of teaching should rest has not been systematically worked out.

In practically all the fields thus outlined scientific observation and experimentation, either in the laboratory or in the school, have been carried on with a view to solving the educational problems involved. That the results represent a body of knowledge possessing precision and completeness no one would claim. But that important beginnings have been made by scientific methods in a field of inquiry and with reference to a specific problem not covered by any other science can be vigorously maintained. The material already secured has "not been hastily got together *ad hoc*, by a process of forced abstraction, to meet the demands of a professional analogy," nor is its presentation "the unprofitable delineation of the obvious." It constitutes a respectable body of fact that will repay the time spent upon it even by the undergraduate student of education. What we need is more fact of the same sort, and with such an outlook before us we may agree with Kipling, "The less we talk and the more we work, the better results we shall get."

THE PRESENT STATUS OF EDUCATION AS A SCIENCE

THE PRINCIPLES OF EDUCATION

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OUTLINE

- I. INTRODUCTION
 1. Education not one science but a professional calling.
 2. Professions involve both pure and applied sciences.
 3. Characteristics of pure and applied sciences.
 4. The relation of pure and applied sciences.
 5. Science as organized knowledge and science as method.
- II. THE PRESENT STATUS OF THE PRINCIPLES OF EDUCATION AS AN ORGANIZED BODY OF KNOWLEDGE
 1. As indicated by college courses.
 2. As indicated by textbooks.
 3. The two basal factors in the teacher's problem.
 4. The resulting subjects of study:
 - a) Educational psychology.
 - b) Principles of education.
 - c) Principles of teaching.
 5. The contents of textbooks classified.
 6. The contents of courses classified.
 7. Criticism of college courses.
- III. A SUGGESTED LIST OF TOPICS FOR THE PRINCIPLES OF EDUCATION
 1. Introduction: the field of education.
 2. The controls of conduct.
 3. The generalized effects of education.
 4. The aim of education.
 5. The elemental educational values.
 6. The curriculum.
 7. The values of the studies.
 8. The construction and execution of courses of study.
 9. Summary.
- IV. SCIENTIFIC METHOD IN THE PRINCIPLES OF EDUCATION
 1. Available sources of progress.
 2. Historical study.
 3. Contributions from the pure sciences.
 4. Generalizations from existing practices.
 5. Formal experimentation and measurement.

I. INTRODUCTION

1. The phrase "the status of education as a science" is likely to prove misleading in at least one serious respect. It is likely to lead people to think that it is the aim to arrive at just one coherent and homogeneous science called "education," as we have one coherent science of chemistry or botany. This is apparently the point of view from which Dilthey, Royce (*Ed. Rev.*, I, 15 and 121), and not a few others have written and spoken.

Now a little observation and reflection will show that from the standpoint of science education cannot be compared with a pure science like chemistry or botany, but that it must be compared with such concepts as medicine, engineering, and architecture. These concepts do not stand for such bodies of knowledge as we have come traditionally to call sciences, but they stand for vast fields of practice in which the results, not only of one, but of many, sciences are applied for the direct benefit of mankind. They stand, not for so many sciences, but for professional callings, among which education should be included.

2. But while a profession from its theoretical side cannot be consistently looked upon as one science, it both rests upon and embraces a number of sciences. These sciences may be conveniently grouped under two heads: pure sciences and applied sciences.

3. It is the aim of the pure sciences to classify and organize the facts and principles that observation and reflection reveal in nature, art, and industry on the basis of their logical similarities and relationships. This classification and organization is prompted primarily by man's instinctive curiosity and tendency toward rationalization, and the result is to give man a consistent, satisfying, and reliable knowledge of the world in which he lives.

In the pure sciences, therefore, man views the world as a theoretical being, as a being that wants to know without necessarily any immediate reference to the use that he or his fellows may make of the knowledge that has been gathered.

But by force of circumstances man is a practical, as well as a theoretical, being. No matter how soul-satisfying theoretical contemplation may be, if it did not also contribute to man's material well-being it would have no chance for survival. The touchstone

of survival is ever the objective test of usefulness, but this limit is social and hampers the individual only when in the indulgence of his powers he transgresses this limit, when he signally fails to reach it, or when society fails to grasp the significance of his performances.

The practical aspect of life gives us the applied sciences. No matter where or for what purpose knowledge may have been gained, it may be used in solving the practical problems of life, and this use, like the satisfaction yielded by insight, is facilitated by organization. The doctor does, indeed, profit by such sciences as chemistry, bacteriology, physiology, and anatomy, but this profit is largely indirect and is gained fully and directly only after the material in them that bears on the preservation and restoration of health has been selected and reorganized into the applied sciences of hygiene, *materia medica*, surgery, and the like.

The difference between the pure and applied sciences, therefore, is found, not in mutually exclusive subject-matter, but in the criteria used for the selection and classification of subject-matter. Whereas the pure sciences select facts and principles on the basis of their logical congruity, the applied sciences select them on the basis of the use to which they are put. The two, therefore, cross-classify, and in one sense are mutually exclusive.

What is true in the professions generally, is true also in the profession of teaching. So far as teaching has a theoretical aspect, this aspect is represented by a group of applied sciences, and these in turn are closely related to a group of pure sciences. These pure sciences are chiefly psychology, logic, sociology, and ethics.

4. The relation that the pure sciences underlying the profession of teaching (or those underlying any other profession, for that matter) bear to the applied sciences involved in the calling is usually expressed by saying that they are basal to them. This is all right when it is interpreted to mean that the person beginning the study of the profession should have at least an outline knowledge of the sciences in order to give him an apperceptive basis and perspective in pursuing the applied sciences, but it is wrong when it is interpreted to mean that the applied sciences must get their facts and principles from the pure sciences and that they must wait upon them for their own contentful advancement.

That there is a relation of content between the pure and applied sciences cannot be denied, but this relation is largely a reciprocal one. The applied scientist may indeed turn to the pure scientist for principles, and even for facts, just as the pure scientist gets many of his facts and problems from the practitioner, but before the applied scientist can make adequate use of the data so obtained he must reorganize them and test their application. The latter step frequently not only involves experimentation, but leads to new problems that fall to the lot of the applied scientist for solution. Indeed, an applied science should certainly progress no less through the researches prosecuted within its own field than through the researches prosecuted in the related pure sciences.

5. This investigative or progressive feature of a science compels us to note still another aspect of the use of the word "science." When applied to any body of knowledge, this word has a twofold significance. It has reference to this body of knowledge either (1) as an organized system of facts and principles, or (2) as possessing an inductive and relatively exact method of investigation. Both uses of the word are justifiable and are in no way incompatible. In fact, a body or field of knowledge, to merit the name "science," should embrace both meanings of the word. Every true science includes both content and method. Physics, botany, geology, and the like would be but names for socially profitless disturbances without their bodies of knowledge, relatively established and organized and therefore available for use; and without vital and somewhat clearly conceived methods of growth the names would but stand for so much dead matter. And what is true of the pure sciences in this respect is true of the applied sciences also. These, too, are characterized both by coherent bodies of facts and principles and by methods of research through which they maintain their growth and vitality.

II. THE PRESENT STATUS OF THE PRINCIPLES OF EDUCATION AS AN ORGANIZED BODY OF KNOWLEDGE

1. *As indicated by college courses.*—The status of the principles of education as a coherent and organized body of knowledge ought to be indicated both by the topics included in college and university

courses in the principles of education and by the topics treated in textbooks on the principles of education.

I quote first the outlines of eighteen courses, entitled "Principles of Education," offered by eighteen different colleges and universities, and then eleven other courses, essentially similar in content to the preceding but bearing different titles, offered by nine institutions. Omitting duplications, twenty-six institutions are represented.

With the exception of New York University, whose outline was kindly furnished by Dean Balliet, all these outlines have been taken from recent catalogues and announcements, but to save space a few of them have been slightly abridged. The aim has been to select only those courses that are intended solely or largely for undergraduates, and the remarks that I have made concerning them should be taken to have reference to undergraduate work only.

CHICAGO, 1910-11. Principles of Education. A course of lectures and readings introducing students to the general problems of education and to the scientific methods of solving these problems.

COLORADO, 1910. Science and Principles of Education. An examination of those facts and hypotheses which have significance for educational theory. Biological, physiological, anthropological, psychological, sociological, and philosophical data will be considered to the end of deciding on a working hypothesis for educational practice.

COLUMBIA (Monroe), 1910. Principles of Education. Third third of Education B (History of Education). (This course deals with the biological, psychological, sociological, and vocational phases of education.)

CORNELL, 1909-10. Principles of Education. This course is designed to be an introduction to the general theory of education, and falls into two distinct parts, one pertaining especially to the school studies and the other to the scientific methods of teaching them. The social and individual basis of education; the basis for the selection of studies; their classification; their function and relative worth; the mental discipline that each should furnish; the organization of studies into curricula; the correlation of high-school studies; scientific basis of high-school methods; etc.

GEORGE WASHINGTON, 1911. Principles of Education. The basis, aims, values, and essential content of education as revealed by biological, psychological, sociological, and ethical principles.

HARVARD, 1910. Introduction to the Study of Education—Discussion of Educational Principles. The following topics indicate the general character of the work: The scope and meaning of education; the fortuitous education of experience and environment; the school as the chief means of systematic education; the development of the individual and his adapta-

tion to the civilization of his time; the special aims of elementary and secondary education; educational values and programs (courses) of study; the relation of psychology and ethics to educational theory and practice; the correlation of studies; general principles of method; the bearing of instruction on character; discipline and moral training; the study of children; school hygiene; vocational education; education as a function of society.

ILLINOIS, 1910. *Principles of Education*. Biological principles which condition and limit education; heredity and environment; psychological principles governing the educative process, especially the laws of attention, habit, memory, and the formation of meanings; developmental principles which describe and explain the changes of childhood and youth; application of these principles to educational practice in connection with the course of study, methods of instruction and training, and school hygiene.

IOWA, 1909-10. *Principles of Education*. Education considered from the standpoint of (1) biology, (2) neurology, (3) psychology, (4) anthropology, (5) sociology. Representative topics: instinct, heredity, habit, culture epochs, individual differences, imitation, suggestion; training of memory, imagination, emotions, will, senses, motor activities, moral nature; formal discipline, educational values, social education, classical and contemporary theories.

MICHIGAN, 1911. *Principles of Education*. The purpose of this course is to outline and examine briefly the distinguishing aspects of the educative process. An attempt is made to interrelate the industrial, biological, psychological, aesthetic, religious, and sociological points of view. The course is planned for those students who desire sufficient acquaintance with educational theory to enable them to read critically the modern literature on the subject.

MISSOURI, 1911. *Principles of Education*. The purpose of this course is to give insight into the meaning of education and thereby to reveal the fundamental principles upon which educational procedure should rest.

NEW YORK, 1911. *Principles of Education*. Brain localization and its bearing on education; the order of maturing of the nervous system and its bearing on educational problems; fatigue; reflex action, instinct, and habit in their bearing on educational problems; the evolution of the feelings and its application to education; the evolution of morals in the race and in the child; the principles of moral education; play; educational ideals critically studied; "formal discipline"; education from the standpoint of the state; industrial education; physical education; etc. (Course intended primarily for college and normal graduates.)

OHIO STATE, 1911. *Principles of Education*. A review of educational theory and the principles underlying teaching.

PITTSBURGH, 1910. *Principles of Education—An Introduction to Educational Theory*. A discussion of the most important applications of psychology to education, based on the study both of child development and of the origin

and organization of the subject-matter of the curriculum. The topics studied include the meaning of education, the social and individual aspects of education, the nature and function of work and play, the relation of motor and mental processes in development, true and false correlation; formal steps of the recitation, the doctrine of interest, formal discipline, educational values and motives, inductive and deductive thinking, etc.

VIRGINIA, 1900-10. Principles of Education—A Summary of Present Educational Theory and Practice. After an introductory consideration of the method and material of educational theory, the aim of education is defined and illustrated at length. Theories of organic evolution are outlined and discussed in their influence upon theories of education. The second and third terms are devoted to a study of school hygiene, educational psychology, curricula, and general method.

WASHINGTON (State), 1910-11. Principles of Education. The nature and development of the child as the basis of the methods and processes of education; ideals of individual and social character in determining the aim of education; physiological, intellectual, and moral training; the special tasks and methods of the school and the teacher as compared with other agencies, such as the home, the calling, the church, social intercourse; the branches of study and their values and methods; discipline, organization, and administration; the qualifications and preparation of the teacher.

WELLESLEY, 1910-11. Principles of Education. A study of the educative process, with a consideration of educational values, the hygiene of instruction, periods of development in the life of the child, and special problems of the high school and the elementary school in the United States.

WISCONSIN, 1911. Principles of Education. The foundation of educational theory viewed in the light of contemporary thought; also practical problems of curriculum and methods of teaching, accompanied by observation in the schools of Madison.

YALE, 1910-11. Principles of Education. Education and psychology; education and ethics. The end in education, what knowledge is of most worth. The process, apperception, interest, the doctrine of formal discipline, the acquiring of knowledge, habituation.

CINCINNATI, 1910-11. Philosophy of Education. The first part of the course will present an integrated view of the facts of the various sciences having educational significance, for the purpose of arriving at a philosophical definition of education as a whole. The second part of the course will deal with the organization of elementary education as determined by its philosophical meaning thus derived and as modified by practical considerations. In the appropriate connections there will be special consideration of the process of education as world-building; the historical and logical origin, meaning, and classification of studies will be briefly con-

sidered; special attention will be given to the question, What happens when we try to know? and to the place of symbolism and systems of institutional and intentional expression in education.

COLUMBIA, (Suzzallo) 1911. Educational Sociology. A systematic presentation of the relation of education to society, being a special application of modern sociological knowledge to the problems of social welfare as achieved through educational activities. The relation of social conditions to school aims, functions, values, organizations, curricula, and methods will be noted.

COLUMBIA (MacVannel), 1911. Philosophy of Education. This course aims to lay the basis for a scientific theory of education considered as a human institution. The process of education is explained from the point of view of the doctrine of evolution and idealism, and the principles thus arrived at are applied from the standpoints of the typical forms of human culture, the institutional factors in the educative process, the course of personal development, and education in the school.

INDIANA (Black), 1910. Elementary Pedagogy. (A) The functions and processes of education determined by the nature of human life considered under its biological, psychological, and social aspects. (B) The science of the recitation and the principles of school management in general, deduced from the foregoing.

INDIANA (Jones), 1910. Philosophy of Education. (1) Fall term. Physical education. . . . A hygienic course of study to be developed. (2) Winter term. Education as individualism will be considered. The formal side of education in its relation to inhibition, facilitation, discipline, interest, and correlation will be thoroughly worked out. (3) Spring term. Education will be considered chiefly as an adjustment of the individual to an ever-changing environment, and will be shown to be a unifying of the individual and social forces for harmony and efficiency.

KANSAS, 1911. Philosophy of Education. The purpose of this course is to study the distinguishing points of view of educational theory. The attempt will be made to interrelate the industrial, biological, psychological, aesthetic, ethical, and social ideals.

LELAND STANFORD JUNIOR, 1911. Educational Theory. An introductory course dealing with the topics fundamental to education, such as the nature of infancy, physical and social heredity, the relation of the organism to environment, of instinct to habit, etc.

MINNESOTA, 1910-11. The Theory of Education. An introductory course in educational theory including a somewhat detailed study of the principles on which is based the present practice in teaching.

NEBRASKA, 1911. Philosophy of Education. The principles underlying all education and their influence in determining the material curricula in schools of instruction.

PEABODY COLLEGE, 1910. Philosophy of Education. In this course the philosophical principles upon which the methods and subject-matter of education are based will be brought out. The meaning of education in its various aspects will be defined, the relation which it bears to the natural and mental sciences indicated, and its field outlined.

TEXAS, 1910-11. Philosophy of Education. In this course will be studied the growth of the philosophical and psychological ideas that have underlain and conditioned the various systems of education. (Historical and psychological.)

While it would be in place at this point to compare these several courses for the purpose of discovering types, agreements, and disagreements, I shall leave these comparisons till we come to the discussion of the organization of the principles of education from the logical side. The disagreements apparently so greatly outnumber the agreements in these courses that the comparisons can be made more readily after a few fundamental principles have been at least tentatively laid down.

2. *As indicated by textbooks.*—

BAGLEY, *The Educative Process*, 1905.

Part I. Functions of education (three chapters).

Part II. The acquisition of experience (three chapters).

Part III. The functioning of experience (three chapters).

Part IV. The organization and recall of experience (three chapters).

Part V. The selection of experiences for educational purposes: Educational values (three chapters).

Part VI. The transmission of experience and the technique of teaching (eight chapters).

BAGLEY, *Educational Values*, 1911.

Part I. The controls of conduct. (Six chapters, one dealing with the instincts as inherited controls of conduct, four with the acquired controls of conduct, and one with heredity as limiting the educative forces.)

Part II. The classification of functions and values. (Nine chapters, one dealing with the aim of education as the criterion of value, one with the rubrics of function and value, six with the values to be realized in fulfilling the various functions, and one with the school environment as a source of educative material.)

BOLTON, *Principles of Education*, 1910.

(The twenty-eight chapters of this book may be roughly grouped as follows:

The first chapter, entitled "The New Interpretation of Education," is introductory, the next six or seven are primarily biological and neurological,

and the remaining twenty or twenty-one deal with psychological topics and their relation to education.)

BOONE, *Science of Education*, 1904.

Part I. The nature of education (twelve chapters).

Part II. Education as a science (two chapters).

Part III. The data of educational science (two chapters).

Part IV. Contributing sciences (eleven chapters).

HENDERSON, *Text-Book in the Principles of Education*, 1910.

Introduction: Various conceptions of the aim of education.

Part I. Education as a factor in organic and social evolution. (Three chapters devoted respectively to readjustment, heredity, and society.)

Part II. The process of education in the individual. (Nine chapters devoted to topics in educational psychology.)

Part III. The educational agencies. (Five chapters as follows: Analysis of educational agencies; the evolution of the school; the functions of the school; the academic and the practical; liberal and vocational education.)

HORNE, *Philosophy of Education*, 1904.

Eight chapters apportioned as follows:

1. The field of education: Introduction.
2. Biological aspects of education.
3. Physiological aspects of education.
- 4, 5. Sociological aspects of education.
- 6, 7. Psychological aspects of education.
8. Philosophical aspects of education.

JONES, *Principles of Education*, 1911.

Seven chapters as follows: The meaning of education; the subjects of study; motivation; utilization of play impulse; the teacher an influence; methods; professional criticism.

O'SHEA, *Education as Adjustment*, 1903.

Part I. The present status of education as a science. (Three chapters dealing with the character of the field of education, effective method in education, and the data for a science of education.)

Part II. The meaning and aim of education. (Five chapters developing the conception and implications of education as adjustment.)

Part III. The method of obtaining adjustment. (Seven chapters dealing with topics in educational psychology.)

RUEDIGER, *The Principles of Education*, 1910.

Sixteen chapters as follows:

1. The field of education: Introduction.
2. Biological bases of education.
- 3, 4, 5, 6. The aim of education and formal discipline.
- 7, 8, 9. The elemental educational values.

10, 11, 12. The curriculum and the values of the studies.

13, 14. The administration of the curriculum and the agencies that educate.

15, 16. The psychological bases of teaching.

These textbooks show but little more agreement in the topics treated than the outlines of the courses given in colleges. Comparisons between them will again be left till after we have discussed the organization of the fundamental courses in education from the logical side, when they can be made more readily.

3. *The twofold nature of the teacher's problem.*—In view of the fact that so little uniformity in the content and organization of the principles of education is found in textbooks and in college courses, it becomes necessary to inquire what this subject should contain from a logical point of view. What should be the guiding principle in the selection of data for the principles of education, and how could these data be most effectively organized? In attempting to answer these questions any one person can obviously do little more than bring up topics for discussion.

It is axiomatic that the primary function of educational theory is to assist the teacher in his work.

When the teacher in the schoolroom reduces the complex problem confronting him to its lowest terms, he finds at least two fundamental and irreducible factors. These are (1) the child that is to be taught, and (2) the subject-matter of instruction and the ideals of conduct and efficiency into which the child is to be initiated. For brevity's sake we may refer to these as (1) the child and (2) the curriculum.

The child and the curriculum are in many respects far apart. The child is immature and inexperienced, but plastic and active, while the curriculum represents the mature and sifted knowledge, ideals, and dexterity of the race. But the first need of the teacher is to understand both sides.

4. *The resulting subjects of study:* a) *Educational psychology.*—The scientific knowledge of the child may be obtained by the teacher from the study of general, genetic, child, and educational psychology. The first three may be looked upon as giving a general outline of this knowledge while the last investigates and

summarizes especially those aspects of mental science that the teacher needs particularly to know. These aspects are especially the study of the child (or adult) as an educatable being and the investigation of the learning process, including not only the acquisition of knowledge, but also the formation of habits, acts of skill, ideals, and attitudes.

b) Principles of education.—An adequate comprehension of the curriculum by the teacher is contributed to primarily by three sources. These are (1) an acquaintance with human life itself, (2) a knowledge of the social sciences, and (3) an understanding of the philosophy of the curriculum as related to life.

Little space can be taken here for the discussion of the first two of these sources. Unless the teacher has a direct acquaintance with life, especially with those phases that are represented by the subjects that he is teaching, he is but an example of the blind leading the blind. The greatest source of realistic and vital teaching is realistic and vital knowledge on the part of the teacher.

But even if the teacher could obtain a direct acquaintance with life in all its phases, which is out of the question, he would still stand in need of a systematic and scientific study of this life. This he may obtain from the study of history, political science (including civics), economics, sociology, and ethics. These are the fundamental social sciences, and as teaching from one point of view may be regarded as applied sociology, it is immensely to the teacher's advantage to cultivate as many of these sciences as his time and opportunity permit. Few will study them all, but too many of our teachers now end with history and civics, and perhaps a little economics.

Assuming the basis of an adequate acquaintance with life itself and of a knowledge of the fundamental social sciences, the teacher still stands in need of a subject that will give him a systematic conception of the relation of the school to life. He needs a science that will apply to education the facts and principles pertaining to human life in general. This science should give him a clear conception of the general goal he is striving for with his pupils, of the elemental values that the various phases of education should subserve, of the curriculum in outline that results from these values,

and of the way this curriculum should be administered in order that these values may be realized.

It is to the subject that gives this knowledge, it seems to me, that the term "Principles of Education" should be applied. This term would be properly descriptive, just as the term "Principles of Teaching" is properly descriptive. The word "teaching" is commonly applied to the process of the teacher's work; "education," to the broader social relations and consequences of that work.

c) *Principles of teaching.*—Logically the principles of teaching should follow the principles of education. It was noted above that the child (which is elucidated finally by educational psychology) and the curriculum (which is elucidated finally by the principles of education) are in some respects far apart. There is a gap over to the curriculum that the child cannot well cross unaided. He needs the teacher as an intermediary whose primary function it is to lead him gradually into the cultural and vocational possessions of the race.

Now in performing this function of intermediary, the teacher needs the principles of teaching to guide him. It is the function of this subject to assist the teacher in becoming an intelligent, resourceful, and progressive worker in the immediate task of classroom instruction and of training in conduct and skill.

The principles of teaching rest primarily upon both the nature of the child and upon the forms and methods that the mind uses in acquiring knowledge. These bases are scientifically set forth respectively by psychology (general and educational) and logic. The spirit of the teaching and the devices used are, however, also profoundly influenced by the teacher's conception of the aim and values of education.

5. *The contents of textbooks classified.*—That the objective or sociological phase of educational theory to which I have applied the term "Principles of Education" is beginning to be recognized as comprising a unit by itself is indicated both by the contents of the textbooks given above and by the outlines of the courses. Parts I and V (about one-third) of Bagley's *Educative Process*; all of Bagley's *Educational Values*; the introduction and Parts I and III (fully one-half) of Henderson's *Text-Book in the Principles of*

Education; practically all of Horne's *Philosophy of Education*; chaps. i and ii (over one-fourth) of Jones's *Principles of Education*; Parts I and II (about one-half) of O'Shea's *Education as Adjustment*; and all but the last two chapters (about seven-eighth) of Ruediger's *Principles of Education* fall distinctly into this field.

The remaining portions of these books and practically all of Bolton's *Principles of Education* are devoted to topics in educational psychology, save that about one-third of Bagley's *Educative Process* and one chapter in Jones's *Principles of Education* are devoted to topics in the principles of teaching. Boone's *Science of Education* is hard to classify, for it seems in the main merely to talk about education.

6. *The contents of courses classified.*—Judging by the descriptions given in the outlines of courses quoted above, practically the entire courses given at Columbia (Suzzallo), Colorado, George Washington, Missouri, Nebraska, Peabody College, Washington, and perhaps Kansas, and large and distinct sections of the courses given at Cincinnati, Columbia (MacVannell and Monroe), Cornell, Harvard, Illinois, Indiana (Black and Jones), Iowa, Ohio State, Pittsburgh, Wisconsin, Virginia, and Yale fall into this field. This includes fully three-fourths of the courses quoted. Parts of the remaining courses may also belong here, but the descriptions given do not make this inference safe.

The courses given at Columbia (Monroe), Cornell, Illinois, Indiana (Black), Ohio State, Pittsburgh, Washington, Wisconsin, and Yale appear to be quite distinctly divided about equally between the principles of education and the principles of teaching (including usually educational psychology). The dividing line between educational psychology and the principles of teaching is still far from distinct, it seems.

To include both the principles of education and the principles of teaching (or educational psychology) under the direct or kindred title of "Principles of Education" appears to be a somewhat common practice. Not only these nine courses, but also, as noted above, the textbooks of Bagley, Henderson, Jones, and O'Shea, appear to follow it, while Bolton's book, under the title of *Principles of Education*, appears even to be restricted almost solely to topics in

educational psychology and the principles of teaching. The more heterogeneous college courses, too, include many topics from educational psychology and the principles of teaching, and this in spite of the fact that in nearly all the schools separate courses in educational psychology are also given.

7. *Criticism of college courses.*—Restricting ourselves now to about one-half of the college courses in the principles of education, it appears to be true that all conceivable topics in educational theory are hopelessly intermingled in them. If the title, “Principles of Education,” is meant to stand for some definite and coherent phase of educational theory, these outlines of courses certainly do not show it. Apparently this title is still used by many teachers of education as a blanket phrase. Save that the material is educational, no uniform principle of selection is apparent. It would be difficult to find any topic in educational theory that is not included in one or more of these outlines, and the topics of but few of the outlines correspond to any considerable degree. In this list there are apparently as many different courses in respect to content as there are persons giving them. This shows a greater primitiveness in the organization of educational theory, if not the content as well, than one would have reason to expect.

The effect of this heterogeneous array of topics under the title “Principles or Philosophy of Education” (and other educational subjects and even the relation between subjects appear to be little, if any, better) has a number of harmful effects. It serves to disgust more students than many teachers of education realize. The average college student wants something definite; he rightly wants to cover a relatively distinct phase of subject-matter in each study that he pursues, and when he finds himself in a subject that apparently possesses no limiting principles of selection and no logical sequence of topics, he is frankly disgusted.

Now when this student goes to another educational course he is likely to find many of the same topics again treated—and treated in a *primary way*—that he has had in the principles of education. This adds to his disgust, for it not only leaves him bewildered but it wastes his time. Allowing for all adequate correlation, it would no doubt still be well within the mark to say that from one-fourth to

one-half of the student's time in teachers' colleges and departments of education is wasted, and this all through lack of organization. This is undoubtedly the most regrettable result that follows the present chaotic state of educational theory.

III. A SUGGESTED LIST OF TOPICS FOR THE PRINCIPLES OF EDUCATION

What are the topics that the principles of education should include and in what order should these topics be presented?

Questions like these are deserving of the best thought of educational specialists. The effective organization of educational theory inheres in their solution, and upon this organization the effective teaching of educational theory is in turn dependent. But the solution of these questions calls for co-operative effort, and any one person can do little more than to lead off in a discussion.

1. *Introduction: The field of education.*—Somewhere in his professional training the student of education should be orientated in his chosen field, and this, it seems to me, could well be done in the introductory chapter of the principles of education. This course should logically come early in the student's professional work, preceding the principles of teaching and following educational psychology, and so a discussion of the field of education would be in place. This is now done to a certain extent in the textbooks of Horne, O'Shea, and Ruediger, and the need of something like this is further indicated by the fact that the courses listed from Chicago, Columbia (Monroe), Harvard, Leland Stanford Junior, Michigan, Minnesota, Pittsburgh, and Indiana (Black) are either explicitly or by inference introductory to educational theory, which accounts in large part for their general nature.

But for the purpose of orientating the student it would seem that an introductory chapter would be better than an introductory course. What the beginner in educational theory needs to know is the most general character and the divisions of the field, and anything more than this is likely to take the zest away from succeeding courses. The idea of a brief, general, diversified course for general culture is not worthy of entertainment. The college student who does not wish to teach but nevertheless wishes an

acquaintance with educational theory could no doubt profit most by fairly thorough courses in the principles of education, history of education, and, perhaps, educational psychology.

2. *The controls of conduct.*—The term “conduct control” has recently been brought into educational literature by Bagley (*Educational Values*). Human life in a broad sense may be regarded as synonymous with conduct, and it may therefore be truly said that it is the function of education to supply conduct controls.

The conduct controls that are operative in human life may be divided into two classes: (1) inherited controls and (2) acquired controls.

Most of the textbooks in the principles of education discuss in some detail such topics as brain complexity and intelligence, the period of infancy, heredity, and, to a slight extent, eugenics. These topics are closely related to what the child should study, it is true, but logically it seems clear that they fall on the child side, rather than on the curriculum side, of the teacher’s problem. They should therefore be discussed in detail in educational psychology, and this is done by Pyle in his *Introduction to Educational Psychology*, and also by Thorndike in his advanced *Educational Psychology*.

But even when the discussion of the biological bases of education is relegated to educational psychology, the closely related native controls of conduct deserve consideration in the principles of education. These controls are obviously the various reflexes and instincts. Of course no full discussion of these is in place here, but their relation to conduct should nevertheless be clearly brought out. Their limiting influence on education should be especially revealed to the student, for much that is of service to teachers has been disclosed by the study of heredity. Heredity forestalls some of the effects that the teacher might like to produce and it is well for his economic expenditure of energy and for his peace of mind to know this.

But even though heredity limits the influences of education, it does not eliminate these influences. It leaves open, or rather provides for, a number of very important channels through which education may have its effects.

The effects of education, to which the expression "acquired controls of conduct" may be applied, may be grouped under three heads: (a) habits, (b) knowledge, and (c) emotional dispositions. These are closely interrelated, for a response that is guided by knowledge or by an emotional disposition at one time may become habitual at another. In a general way we may designate these three rubrics as the "what" of education and we may say that they are imparted respectively by training, by instruction, and by inspiration.

The range of habits that should be made or influenced by education is a wide one. It includes not only acts of skill, deportment, and the mechanization of knowledge and processes frequently used, but also many phases of conduct that have an ethical significance. It is rightly expected that education should form as well as inform a person.

The knowledge that is imparted by the instructional phase of education is thought of by many as being limited to the facts, principles, and laws embodied in the textbooks on the various studies. This is a mistake, for the vital knowledge of a subject includes not only facts, principles, and laws, but also the technique and methods used in acquiring and applying these facts, principles, and laws. Knowledge is a dynamic, not a static, affair. Every subject includes both content and method, and either alone is but a dependent abstraction. Scientific culture includes the mastery of scientific method and the ability to use information certainly no less than a knowledge of scientific facts and principles. The conception of scientific method, for example, is not merely something to be acquired along with the study of zoölogy; it is an indispensable phase of the knowledge of zoölogy itself.

Through the inspirational aspect of education are imparted all those emotional dispositions that we know by such terms as ideals, standards, appreciations, prejudices, tastes, and attitudes. The life of the average person is governed by these dispositions probably more than by knowledge content, and they may be derived from all of the school studies, especially from history, social science, literature, and art, and also from methods of work and from the atmosphere of school, home, and social life. Moral and social training

fall primarily under this head. It is here especially that the personality of the teacher is of first importance.

3. *The generalized effects of education.*—If the so-called doctrine of formal discipline is to be discussed at all in the principles of education, this may logically be done immediately after considering the acquired controls of conduct. These controls function not only in the specific channels in which they have been acquired, but most, if not all, of them are to a certain extent generalized in their effects. Habits, indeed, are specific responses to specific stimuli, but a variety of situations may have present the one element that sets off a certain habit. Thus the habit of courteous deportment acquired in the home may function in the school, church, and street, and therefore may be said to be socially, even if not psychologically, generalized. The other acquired controls are all in a measure generalized through the three well-known channels of identical or common elements—content, method, and aim.

The discussion of formal discipline in textbooks is now overdone. It is found in the texts on the principles of education, the principles of teaching, educational psychology, and even general psychology (Pillsbury).

It may indeed be asked if it is not about time to relegate the phrase “doctrine of formal discipline” to the historical side of educational theory. This expression, together with the conception underlying it, rests on false psychology, and it should go the way of that psychology. In the modern conception of psychology the old notion of formal discipline only causes confusion. It is out of harmony, and the expression “the generalized effect of education” serves the purpose much better.

Logically one would think that a full discussion of the generalized effects of education belongs to educational psychology. But even so, a brief summary of this topic may well be included in the principles of education at this point. Only a brief chapter need, perhaps, be given to it, and the point of view from which it would be presented would necessarily differ somewhat from that adopted in educational psychology.

4. *The aim of education.*—No one doubts that the consideration of the aim of education falls within the domain of the principles of

education. This topic is propaedeutic to the curriculum. It gives the educational administrator a criterion for the selection of subject-matter and the classroom teacher a vision of the goal that he must endeavor to achieve.

The aim of education is a large topic and for its adequate exposition requires a number of chapters. Philosophers and educators have discussed this topic ever since the dawn of history, and if the present ideals in education are to be understood they must be considered in the light of their historical development. Not only should the principles of education be preceded by the history of education, but the historical evolution of educational ideals must be traced also within the principles of education. The history and the principles of education are necessarily closely related, and whether they are taught in succession or simultaneously, they should always be closely correlated. But insight into secular history, economics, sociology, and ethics is also highly desirable for the comprehension of the educational aim.

It is primarily from the historical standpoint that one can harmonize the social and individual elements in the aim of education. Society in Athens, where the ideal of personal culture developed, was very different from what it is now, and it is only in thoroughgoing social democracy, such as we are hopefully tending toward in America, that a genuine ideal of social service can develop. The student must be led to see, however, that there is no inherent contradiction between these two ideals, at least so far as the vast majority is concerned. They are mutually supplementary, and because man is instinctively a social animal and so cannot realize his own life except in a social medium, the two ideals are comparatively seldom in conflict. But when such conflict occurs, the individual is not necessarily always the one who is in the wrong. Witness in this respect the fate of Socrates and of Jesus. The life to which the educated person should be adjusted is progressive as well as social. This, of course, means no more than to say that not necessarily present, but ultimate, social good should be the criterion of conduct and of educational forces, which are among the determinants of conduct.

Viewed from the contentful side, there is at present a very

general agreement as to how the goal of education should be achieved, but educators are not yet agreed as to the best way of defining this goal. This disagreement results from the fact that the goal may be defined from one of several points of view, of which two are now in the lead. These are the social and the biological. From the former the end of education is defined as the production of the socially efficient individual, while from the latter it is defined as the adjustment, or readjustment, of the individual to his environment. The ultimate meaning back of the definitions is approximately the same, and their relative merits are further so closely balanced that both have numerous and distinguished adherents. The biological point of view appears to have this advantage, however: it views education from a position far enough away to include positively the rights of both the group and the individual, while the social point of view regards education solely from the side of the group. In some essential respects the rights of the individual are undoubtedly subordinated to the rights of the group, but this subordination is not omitted in the biological point of view.

5. *The elemental educational values.*—But whether the aim of education is defined as adjustment to environment or as social efficiency, we have in either case only a general definition of the goal toward which the teacher should strive. The teacher gains much by being distinctly aware of this goal, but for some of his work this is not specific enough. He needs to know in detail the value or values that ought to be derived for the pupils from each study that he is teaching. There are at least two reasons why he should have this knowledge.

In the first place, when a teacher is not clearly aware of the values that he ought to obtain from each study, it is only by chance that he will be teaching in the most effective manner; and his teaching from subject to subject is likely to be very uneven. He may hit it right in one subject but miss it in another. When literature is taught from the disciplinary, conventional, or utilitarian motive, more harm than good is likely to be done, and the motives or ends that give good results in literature may fail in mathematics.

The effectiveness of teaching depends, not only upon the methods employed, but also upon the goal in the teacher's mind. As this

goal varies from subject to subject, and even among phases of the same subject, it is necessary that the teacher have a clear conception of the elemental educational values.

A second reason why the teacher should know the elemental educational values is found in the fact that he is frequently called upon to give advice on the selection of studies both by parents and by pupils. He ought to be able to give this advice in as thoroughly a scientific manner as the chemist gives advice in his field or the electrical engineer in his. Indeed, for social purposes the teacher should be an educational engineer, and for this the general conception of the aim of education is not sufficient.

For some reason, probably because they have had but little immediate contact with elementary- and secondary-school work, educational specialists have given much less attention to the analysis of the elemental educational values than this problem deserves. The problem has also been obscured by the disciplinary conception of education, for under this conception only one result, mental discipline, and perhaps personal pleasure, was thought to result from the perusal of the school studies.

In ancient times Aristotle made some inquiry into the effects of studies from the contentful side, and in modern times this problem was opened by Spencer.

Spencer classified the various activities of life that the school should influence into five groups, as follows: (1) Those activities which directly minister to self-preservation. (2) Those activities which, by securing the necessities of life, indirectly minister to self-preservation. (3) Those activities which have for their end the rearing and discipline of offspring. (4) Those activities which are involved in the maintenance of proper social and political relations. (5) Those miscellaneous activities which make up the leisure part of life, devoted to the gratification of the tastes and feelings (*Education*).

W. H. Payne, in his *Training of Teachers* (1901), p. 143, says: "Studies serve three main purposes and therefore have three main values. They serve for discipline, as a mental gymnastic; they endow the mind with instrumental knowledge, or knowledge for guidance; and they serve for delight."

Bagley, in his *Educative Process* (1905), p. 225, says: "These values fall into five classes: (a) utilitarian, (b) conventional, (c) preparatory, (d) theoretical, and (e) sentimental."

Ruediger, in his *Principles of Education* (1910), p. 153, summarizes the contentful values in the following outline:

Instrumental	{	Apperceptive	{	Preparatory
			{	Introductory
		Practical	{	Direct—for the individual
			{	Indirect—for the group
	{	Socializing	{	Sympathy
			{	Toleration, etc.
	{	Moral	{	Integrity
			{	Reliability, etc.
{	Conventional	{	Ornamental	
		{	Index to culture	
Cultural	{	Sentimental		
	{	Liberalizing		

doubt as to their adequate classification or arrangement. No arrangement of values yet given appears to be logically satisfactory.

The way out of this difficulty must no doubt be sought in the fact that these values may be viewed from two distinct standpoints—the personal and the social. These have in the past not been kept sufficiently separate, and this has resulted in cross-classifications, which are always confusing. Clearness of thought appears to demand here that these values be viewed separately from both the personal and the social points of view, however closely these are interwoven in life and even in teaching.

In arranging these values we must ask and answer two questions, and ask and answer them in succession: (1) Of what use is it to me to be educated? and (2) Of what use is it to others to have me educated?

Omitting for the time being the preparatory and introductory values, which are primarily apperceptive and therefore need further justification, and granting that the effects of education are training, instruction, and inspiration as defined above we may answer the first question by saying that education is of value to me because (1) it helps me to gain the needs and conveniences of life (practical or utilitarian value); (2) it helps me to get along more harmoniously with my fellows (socializing value); (3) it helps me to gain social standing or prestige (conventional value); and (4) it aids me in gaining pleasure and satisfaction (*a*) by opening up new avenues of enjoyment (sentimental value), and (*b*) by giving me understanding or insight (liberalizing or interpretative value).

These four or five rubrics represent fairly distinct values that the effects of education have for me and I may take a direct interest in each. But, in so far as they refer to me, others are interested directly only in the practical, socializing, and, perhaps, the conventional values, and only indirectly in the sentimental and liberalizing values.

It is of concern to others that I be self-supporting and that I contribute something—food, professional services, and the like—that they need; also that I be responsive and co-operative. But for the effective realization of these values much more than the possession of merely those facts that are directly applied is needed.

The duties of citizenship and the efficient pursuit of a calling require broad and diversified insight. The problems that present themselves are related to many other problems and these relations must be seen and their bearings understood. We have here, indeed, the objective functioning of the liberalizing or interpretative value of knowledge. Breadth of knowledge gives perspective, and it is through this perspective that the practical and socializing values are adequately realized.

The effects of education have a social conventional value because they contribute to the community of habits and ideas that make social intercourse rich and enjoyable. Others are interested in my knowledge and accomplishments from this point of view because they may derive pleasure from them. Furthermore, because society is, and for social purposes must be, divided into groups or strata, certain habits, knowledge, and accomplishments are taken as indices to the culture necessary for admission to certain groups or strata.

The sentimental and liberalizing values are personal in their reference and from the social point of view we are interested in them only indirectly. They are motives that keep the individual occupied on a higher plane in his leisure moments, thus conserving his substance and leading him into knowledge that he may later apply in economic and social situations. But the recreation that the indulgence of one's trained tastes and sentiments affords is perhaps the greatest indirect benefit that is derived. Recreation means increased buoyancy and health, which obviously have a vital bearing on economic and social efficiency.

Although the sentimental and liberalizing values are primarily personal rather than social in their reference, it is true, nevertheless, that they should be realized only through such material and activities as are not interdicted by the social good. But in realizing them the best results, as a rule, are obtained when the individual aims directly for his own enjoyment and satisfaction, leaving the ulterior effects, which may justify them ultimately, to come as by-products.

6. *The curriculum*.—After the student or prospective teacher has gained a clear conception of the elemental educational values, he should proceed either to the consideration of the curriculum as

a whole or to an analysis of the fundamental values contained in the various subjects found in the school. The order adopted may be left to the tastes of the teacher, for either order appears to be logical and compatible with good teaching. But the distinction between the content, form, and expression subjects, or, perhaps better, between the content, form, and expression phases of subjects, can be made more readily, it would seem, in organizing the curriculum, and as these distinctions are necessary in evaluating the various subjects, we have at least this much ground for considering first the curriculum as a whole. But whichever order is adopted, the teacher must bear in mind that the curriculum and the values of the studies are really but two phases of the same topic.

The curriculum bears a relation to courses of study similar to that borne by a map of the world to the courses that travelers may take in traveling around the world. A traveler needs the map in order to select his course properly and to apportion his time advantageously. Similarly the teacher needs a complete and organized view of the curriculum, which to him is a condensed chart of civilization, in order that he may miss nothing essential in guiding his pupils along courses of study, in order that he may correlate subjects properly, and in order that he may apportion the time of his pupils advantageously.

Many schemes for the classification of studies have been suggested, but, because the interrelations of studies require all three dimensions of space for their adequate exhibition, none presented on paper is entirely satisfactory. Perhaps the most satisfactory classification is the one suggested by Dr. Elmer Ellsworth Brown, which I have developed briefly on p. 179 of my *Principles of Education*. Brown's scheme, while fundamentally threefold, may also be looked upon as ninefold. The fundamental divisions are those of the humanities, the natural sciences, and philosophy. From the opposite point of view we have the content, form, and expression subjects. Into this scheme, when elaborated, it appears that all studies can be logically fitted, although all their essential interrelations are not exhibited.

7. *The values of the studies.*—This topic needs but little space here, although it deserves much in a course on the principles of

education. The elemental educational values are presented, not merely for theoretic contemplation, but for the sake of having them applied. It is surprising to find how much difficulty teachers experience in analyzing unaided the values of the subjects they are teaching. Many appear still to be blinded by the notion of formal discipline, and an apparently equally large percentage does not have a sufficiently broad acquaintance with life to realize the values that the studies should subserve. They need help at this point and the course in the principles of education is the place to give it. Something may later be expected in this respect from courses in special method, but the values of all the studies are likely to come in for consideration only in the principles of education.

8. *The construction and execution of courses of study.*—After the studies and the curriculum in general have been discussed, there still remain a number of chapters in educational theory that logically belong to the principles of education. These pertain more or less directly to the course of study and have for their function the presentation of those principles that underlie the construction and the execution of the course of study. Ruediger's *Principles of Education* presents these principles in the chapters entitled "The Administration of the Curriculum" and "The Agencies that Educate." Henderson covers this ground in five chapters entitled, respectively, "Analysis of Educational Agencies," "The Evolution of the School," "The Function of the School," "The Academic and the Practical," and "Liberal and Vocational Education." In Bolton the chapters entitled "The Theory of Recapitulation" and "The Culture Epoch Theory" would classify here in part as laying the basis for the course of study. I say "in part" because the full discussion of these topics belongs logically to educational psychology. Only so much of them need to be reviewed here as bears on the course of study. Bagley's final chapter in his *Educational Values*, entitled "The School Environment as a Source of Educative Material," also belongs here in the main.

The title of these chapters tells what belongs to this phase of the principles of education perhaps better than any brief discussion that I myself might present. This corner of the field has been but little cultivated in a systematic way and so is not yet thoroughly organized.

9. *Summary*.—Such, in outline, appear to me to be the leading topics that belong to the principles of education. The pivotal point of the course is the curriculum, but this must be led up to by a rounded exposition of the aim of education and by an analysis of the elemental educational values; and it must be led down from by the presentation of those principles that underlie the construction of courses of study. With this conception in mind, the class is ready to proceed to the principles of teaching whose function it is to present those principles that will assist the teacher in initiating his pupils into the studies, ideals, and activities represented by the curriculum in general and by the course of study in particular.

IV. SCIENTIFIC METHOD IN THE PRINCIPLES OF EDUCATION

1. *Available sources of progress*.—While from the standpoint of teaching the principles of education a discussion of this subject as an organized body of knowledge is of primary importance, from the standpoint of educational progress the topic of this section is of first importance. College teachers of education, like all college and university teachers have a twofold obligation. They should assist both in preparing efficient teachers and in advancing the theory and practice of education; i.e., they should both teach and advance knowledge.

Educational progress on the side of the curriculum and the course of study, and *pari passu* in the principles of education, can be contributed to from the following four sources at least: (1) By a historical study of the relation of the school and society; (2) by utilizing the advances continually being made in the pure sciences; (3) by generalizing from existing educational practices; and (4) by formal experimentation and quantitative measurement.

2. *Historical study*.—That the experiences of the historic past throw light on the curriculum, course of study, and the ideals that should actuate teaching does not need emphasis before a body like this. The study of history in general is justified primarily by the light that it throws upon the present, and this is true in education no less than in other lines. Indeed, many of the present activities in education, like those in religion, government, commerce, industry, and social life, cannot be understood save when viewed from the

standpoint of their development, and this knowledge not only enables us to manage the present more effectively, but also to guide progress. Take the introduction of the vocational subjects into the curriculum as an example. The motives for introducing these subjects, the opposition encountered, and the schools, equipment, and tactics needed are all in part illumined by historical study. Think also of the various and even conflicting ideals that dominate education at present. Only historical study can round out the grasp of these ideals and point the way toward harmonious readjustment. But this readjustment cannot be made once for all. The continual changes in life make this an ever-present problem, thus making a continual demand on historical knowledge.

3. *Contributions from the pure sciences.*—But this historical study at best gives us only half of the picture. The effective administration of education depends first of all upon the needs and conditions of the present, and this must be understood not only historically but also directly.

The sciences that contribute the direct comprehension of our civilization are primarily psychology, anthropology, sociology (including ethics), economics, and political science. Many of the advances made in these sciences have a bearing on the content, ideals, and administration of the curriculum, and it is the duty of the specialists in educational theory to be on the lookout for these advances and to adapt them to educational practice. In this there is nothing incongruous. The principles of education is an applied science and therefore naturally cuts across many of the pure sciences, whose data, indeed, do not function in practice until they have been taken over by the applied scientist or the practitioner. The pure and the applied scientist may often, of course, be the same person.

4. *Generalizations from existing practices.*—When we look upon the content and practice of education as they were no farther back than at the time of Basedow and Pestalozzi and then look upon them as they are today, we are fairly struck with the amount of progress that has been made. This progress has been made less, no doubt, through formal experimentation and measurement than through informal trials and successes and through the generaliza-

tions and descriptions made on the basis of existing practices by the insight of educational leaders.

Education is a practical art as well as an applied science. It ranks in this respect with agriculture, government, navigation, and business. In all these fields practice rests at present only in part on scientific laws and principles held consciously. But all successful practice undoubtedly does rest upon such laws and principles, and it is the duty of the scientist to make them explicit. He should study the practices about him and generalize from them. It is in this way that by far the most of our principles of education and of teaching have been obtained. Nor should this method of inquiry be disparaged. Social life is the primary laboratory for the social sciences and it is abundantly in place for the scientist to make use of it as such.

5. *Formal experimentation and measurement.*—The informal experimentation discussed in the preceding section and the formal experimentation now so much emphasized in educational circles merge into one another imperceptibly. Just where the experimental schools of Comenius, Basedow, Pestalozzi, Froebel, Dewey, Montessori, and others should be placed it is difficult to say. All these schools have been instituted for the purpose of advancing both the content and the method of education, and they have unquestionably assisted in this advance; but they have seldom, if ever, given us quantitative results. Their results have been formulated as principles rather than as exact, mathematical laws.

The importance of these non-mathematical generalizations should again not be underestimated. Ordinary practice can be guided by them very efficiently in most respects, and it is in the main only when precise comparisons of results are desirable that quantitative formulations are needed.

Educational theory is now in possession of a number of quantitative studies, but these appear to fall entirely into the domains of educational psychology, educational method, and school administration. In the principles of education, as here defined, only general studies have so far been made. But there is no reason why the effects of different curricula, ideals, and the like should not be subjected to statistical study and mathematical measurement.

The report of the University of Chicago Elementary School as given in Dewey's *School and Society* approaches this, and as laboratory schools in connection with teachers' colleges and departments of education get more common we can expect much more in this line. It is more difficult to measure precisely the social influences of education than to test methods of instruction, and so far the facilities for making such measurements have been but meagerly available; but the laboratory schools that are now being established will bring in this opportunity and we may rest assured that our college teachers of education will take advantage of it. It would be well indeed if every school system of considerable size would set apart one of its schools as a model or laboratory school with a well-trained educational expert in charge. Scientific progress in education would then begin to have the chance that its importance deserves.

THE PRESENT STATUS OF EDUCATION AS A SCIENCE

THE PRINCIPLES OF EDUCATION

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What constitutes a course in the principles of education furnishes the theme of the preceding paper by Professor Ruediger. After discussing the meaning of science and contending that education is a profession, or an "applied science," based on several other "applied sciences," the writer carefully outlines, with supplementary critical comments, courses in the principles of education in twenty-six colleges and universities and the contents of eight books on the subject. He then maintains that the data for such a course should include the field of education, the biological basis of education, the aim of education, elemental educational values, specific and general effects of education, the curriculum, the values of studies, and the construction and execution of courses of study. The paper concludes with a discussion, to which I have not had access before the preparation of this manuscript, on scientific method in the principles of education.

I. DISCUSSION

The aim of my discussion is to offer some constructive criticisms of the general point of view, presuppositions, and conclusions of the above paper, and to consider in some detail the questions implied in our subject—What is the nature of the principles of education and from what source or sources may they be derived, i.e., How may we establish a scientific basis for education as a branch of learning (*Erziehung*)? These points will be treated respectively.

The preceding paper adopts in general the philosophical point of view, but upholds the thesis: 'Education is not a science, but an applied science, or a professional calling, which has a theoretical

side embracing a number of applied sciences, which are exclusive of pure sciences, in that they select their facts on the basis of the use to which they are put, and not on their logical contiguity.' It is not my purpose to contend that education does not have its theoretical and professional aspects, but I cannot agree that these rest solely on the so-called "applied sciences," which in turn are defined as types of practices. As Huxley showed, in his *Essay on Science and Culture*, it is misleading to make an arbitrary distinction between "pure" and "applied" science on the basis of logical contiguity, since this is essential to any science; and, furthermore, "applied science" is simply a misnomer for special applications of science. It is, therefore, usage rather than a sound epistemology which has originated such a distinction. That some sciences are more concerned with the practical phases of life is not to be denied, and this, together with the organization of the material, would lead me to object to accepting ethics and sociology as "pure sciences," since the one is concerned with mind as active, with conduct, and with what *ought* to be, and the other with social practices and with what these should be, practically or theoretically. Would not the term *practical* science be a better one to use?

With Professor Ruediger's criticisms of the courses in the principles of education I would, in the main, agree, except that I believe we have come now to a stage in the development of our subject when it would be most profitable to distinguish the scientific principles of education from its purely philosophical aspects. My reaction to this paper, and, in general, to the recent books on the topic, is against assuming that the philosophy of education is equivalent to the science of education, and that the latter consists of the theoretical correlation of fundamental principles of other sciences to the serious neglect of its own data. Though the two branches of learning differ significantly in their aims, scope, and methods, in the preceding paper philosophy of education is apparently accepted as a working rubric for the subject.

2. PRINCIPLES ARE REVEALED THROUGH SCIENTIFIC INVESTIGATIONS

The principles of education connotes the scientific basis of the subject, similar to the terms, principles of geology, physics, chemistry,

biology, or psychology, which include both facts and laws derived from the facts or exemplified by them. Many of these principles involve a critical inquiry into their relationship with those of other sciences and with life. It is here we find the field and purpose of the philosophy of education. These less fundamental and special principles of science, though they may be universal in application, are those upon which fewer facts depend, since it is frequently necessary to solve immediate problems provisionally and formulate less general principles through experiment and practice before the more general and fundamental one can be found. To depend solely on the philosophy of education would destroy the possibility of having an empirical and experimental science of education, because a philosophy, which aims to take the place of a particular science, develops into shallow dilettantism. The principles of our subject at present may be most advantageously sought through scientific procedure, and we must be more determined in our enterprise if we live up to our present opportunities.

In order to develop sound fundamental principles and norms, the subject needs to be characterized by painstaking detail of scientific procedure, investigation, and experimentation. It is the scientific attitude and method which acquire a multitude of organized facts for analysis, description, and explanation, that will give us principles for our new science. No science is isolated in the manner held by the previous writer, but all sciences work into each other and are interdependent, especially during the earlier stages of their standardization. No science can appropriate the results of other sciences and become a new science. The allied sciences are not adequate to furnish and explain all the principles involved in education, since they are necessarily incomplete; and, what is equally important, education has its own data, its own viewpoint, its own problems and situations, its own history, its own practices and opportunities for experimentation. While education will develop proportionally with its most closely allied sciences, during the next decade we must look, in the main, to experimental education and educational practice as the chief sources for the discovery and formulation of new principles.

3. EXPERIMENTAL EDUCATION; SOME TYPE PROBLEMS

If our standard of worth is physical, mental, moral, and social development, or social efficiency, it is necessary to study education in action under natural and experimental conditions, directly and indirectly, i.e., to apply scientific methods to all the various phases of education. This is what is meant by "experimental education" in this paper. We must try this line of action and that line, and note effects, for almost any field of contemporary practice, if rightly studied, will give us some of the principles for which we have long been seeking on a-priori grounds through the method of subsumption.

If, then, I interpret contemporary educational tendencies correctly, the assertion can be made that the science of education is being most effectively developed and formulated through the efforts of sound fundamental research in the problems of education as such, rather than through the work of men in other fields. Experimental educational psychologists have been most successful in working out problems through an extension and modification of their methods, but since this phase of our general topic has been carefully treated in the preceding papers, it remains for me to call attention, as briefly and concretely as possible, to some examples of other lines of activity.

Courses in experimental education, or experimental pedagogy, are now found at Berlin, Geissen, Königsberg, Würzburg, Breslau, Halle, Leipzig, and at Columbia, Chicago, Harvard, Cornell, Wisconsin, Missouri, and several other colleges and universities in this country. At The University of Texas we have practically three such courses, one in the philosophy of education, one in school administration, and another in experimental education under my direction. In this course I have eighteen students, of whom nine are graduate students, and each is doing some research work. It is our predominant aim to attack each problem from the standpoint of consecutive observations, chronologically or serially. For example, one man has for his field *Retardation and elimination in The University of Texas: an individual study of the class entering in 1906*; another, *The influence of late entrance on university standing*:

an individual study of the class of 1907; others are working on retardation and elimination in the Austin schools, following the same individuals from the day they entered school and consulting them individually, as well as their parents and teachers. These studies are revealing some fundamental principles in regard to individual differences in rate of learning, economy in administrative work, and types of remedial agencies. Another student is working on the relation of lung capacity and physical defects to school standing, where very careful records have been kept on the same individuals for periods from seven to twelve years; another is working on tests in general intelligence, and the same pupils will be followed up for several years. The others are pursuing special problems in different branches of learning, including English, mathematics, reading, science, and geography. The central idea is to have all investigations follow the same individuals as they pass from grade to grade or from school to school.

That the other "applied sciences" will not hand over our data definitely formulated may be illustrated more in detail by my own problem in this class—*The relation of mental development to physical growth and physical defects*. I found it impossible to approach this problem intelligently until more principles of physical growth were determined. This could not be done from a comparative study of the work of others, since no studies have been made where the same group of individuals have been systematically measured, physically examined, and carefully graded throughout their scholastic age. The life-history of these 200 boys and girls, presented in 600 individual curves, based on over 5,000 measurements, gives, among other things, a vivid picture of the relationship between physical development and chronological age, showing that tall children are from one to four or even five years older than short ones, that they have their characteristic pubescent changes earlier, and, therefore, they should be treated physiologically as older children than their age in years would indicate. The high variability of this group indicates that averages are almost useless in studying physical growth, since each child is governed by his own inherent laws, expressing physiological age. It would follow that we are justified in making averages only when we base the

average on the physiological age instead of the chronological age, or, in other words, when we find the average chronological age at which rapid acceleration begins instead of when we find the average height, weight, or lung capacity at a given age based on date of birth. This evokes a new and very important educational problem: How may we formulate a measuring scale for determining the physiological age of the child now that we have the Binet tests for his mental age? The individual growth curves furnish splendid material for the study of this problem. The curves will also enable us in the future to prophesy with considerable accuracy how tall a normal child will be between four years of age and adult life, providing the height is known at any given interim. The same is true in general of weight, lung capacity, and weight-height index, though there are more fluctuations here. The results also demonstrate that children from the wealthier class of people are better developed than those reported by other investigations, and that these children's height, weight, and lung capacity have actually been increased during their scholastic age through systematic medical inspection and physical training.

The effect of the development and removal of adenoids and the inception and recovery from diseases on growth and school standing is revealing even more interesting results; the same may be said of the correlation between growth and school standing. This illustrates what I mean by experimental education furnishing us working scientific principles in education, and the problem is a case at hand where we could not wait for an allied science to furnish the data, since it did not have it, and we were forced to work for the data from an educational standpoint in order to work on the other problem more specifically in our field.

For further examples, we may select almost any contemporary educational principle such as "The individual is the center of reference for all educational activity," and see how it developed content. We can trace the application to the psychological principles bearing on the learning process or to educational practices, which have emphasized the individual. Both of these tendencies have been leading to detailed studies of individual differences, which in turn are bringing about remarkable changes in the conception of

the study of education. This is not solely the result of educational psychology nor school administration, but is the result of the evaluation of educative processes, mechanical and mental, and the application of experimentation in the field of both.

How are we working out the educational principles involved in the problem of promotion and grading? The methods may be traced to the psychological study of the individual and the application of administrative economy by means of experimentation under fortuitous or controlled conditions. Each has reacted on the other. The Batavia (103)¹ plan grew, in the main, from a congested schoolroom situation and later led to the study of individual differences; the St. Louis (102) plan, from an attempt to remedy the elimination from the upper grades; the Mannheim (105) plan, from the inability of the schools to hold their pupils and the conception that children mentally fall into three or four distinct classes. The plans worked out by Van Sickle at North Denver (106) and at Baltimore (107) are the result largely of the study of individual differences; the group systems are based on the common physical and mental traits of children. In the Santa Barbara (101) scheme the assumption is made that the normal child of one year of age is not the normal child of another and the "concentric method" is applied to subjects. A detailed study of these illustrations will show that the problems of promotion and grading not only involve, but also furnish us, some of the fundamental principles of education. I have not learned of a single book on the principles of education which gives these problems due consideration. This is strictly an educational problem and should be subjected to careful experimentation. Mr. Search (104) has tried to solve it by emphasizing the individual differences on a theoretical basis of administration; most of our cities are employing the administrative side to the serious neglect of the appreciation of differences in mental development.

That we are developing a technique of terms and methods is shown by our recent productive studies in retardation, elimination, school standing, grading, progress of learning, mental age, and similar terms; and that we are analyzing very complex situations

¹ The numbers in parentheses refer to the bibliography at the end of this paper.

into simpler elements and expressing the results quantitatively, is shown by such work as that of Thorndike, Ayres, and others. We have also gone beyond the analytic and descriptive stage of the science and have made a good start in evaluating results of education in terms of *school progress* (Dearborn, Foster), *mental age* (Binet, Burt), *specific mental functions* (Bonser, Lindley), *physiological age* (Crampton, Baldwin), *age and school standing* (Thorndike, Ayres), *later success* (Cattell, Dexter), *formal discipline* (Angel, Bagley), *correctional education* (Healy, Witmer), *administrative economy* (Baltimore and New York commissions), *the city and rural school as community center* (National Society for Study of Education). Similar standardizations of methods of teaching special subjects are being carefully worked out by the *Journal of Educational Psychology*. Much is also being accomplished through the valuable experimental studies by Rice, Stone, and Courtis in arithmetic; by Cornman, Pearson, and Wallin in spelling; by Meumann, Freemann, and Thorndike in writing; and by Judd, Dearborn, and Huey in reading. These experimental studies are giving us both specific and general principles, which in many instances are applicable in other lines of education. Before attempting to find the rôle of education in other sciences, or the rôle of other sciences in education, it is best that we gradually develop the science. Its relationship to other sciences will follow.

Experiments on the phases of educational practice help to create a general intelligent interest in the work, as well as to eliminate some of the waste from insufficient teaching. These practical situations give us some broad general principles; they enable us to verify principles worked out along more scientific lines, and to give the schoolmen definite guides for evaluating their schoolwork as well as means for reporting reliable data. It is a significant fact that forty colleges and universities in the United States are now giving from five to forty weeks of practice teaching under trained supervision, and twelve of these have experimental and demonstration schools under their immediate direction and control.

In our experimental work we need not only aggressive scientific analysis, but consecutive studies through a long course of years, giving full, accurate, and systematic accounts of problems in school

administration, methods of teaching special subjects, and the accompanying changes in the progress of learning. Like all sciences, it is essentially the point of view and methods of attack which this new phase of education takes, that characterize it as a science and distinguish it from the history of education, methods of teaching, school administration, etc. Its purpose is to analyze, classify, describe, explain, and evaluate educational processes through experiment, which may be arranged in such a uniform manner that they may be described and repeated with a high degree of accuracy or with clearly defined modifications under systematic control. The results may then be reduced to quantitative exactness, detailed qualitative description, and principles based on cause and effect; and also generalizations of facts and empirical laws may be formulated.

4. EXPERIMENTAL SCHOOLS

One of the best means for the discovery and application of principles of education is to control, direct, and modify the scholastic life of the child on an experimental basis, aiming to "try out" definitely conceived theories, to verify observable principles from miscellaneous school practice, and to discover new principles which may be further tested. This is what Pestalozzi attempted and what Froebel did most successfully, although the followers of each have, in many instances, stereotyped the principles into dogmas or changed them into petty devices. Experimental schools like those of Pestalozzi and Froebel isolated and intensified certain principles which were not apparent in more complex situations. In the one, these centered in the main around sense perceptions; in the other, around self-activity. Today there are several similar schools, and the number is rapidly increasing. In Germany, Rein's Uebungsschule at Jena (115) is a good example; in France, Binet's laboratory school at 36 Rue Grande aux Belles, Paris (109); in Italy and Switzerland, the Montessori Schools (114); and in England, the Fielden Demonstration School at Manchester (112). In this country, aside from several preparatory schools which are attempting reform movements in education, we have in Chicago the Francis W. Parker School, which emphasizes community life, and claims the formation of character and not the acquisition of knowledge as

an end in itself is the chief purpose of the school. It therefore discourages all artificial incentives such as grades and prizes. The University of Chicago Elementary (110), (117) and High Schools (113), and the Speyer and Horace Mann Schools at Columbia (111), (116) have become great working laboratories for educators and psychologists throughout North America. There are schools at the universities of Arkansas, Minnesota, Missouri, Nebraska, North Dakota, Utah, South Dakota, Wyoming, and William and Mary College (108). The University of Wisconsin, Bryn Mawr College, The University of Texas, and other institutions are planning to organize such schools in the near future.

Some of the above schools have been organized to exploit a particular man's theory of education or to work out a general philosophy of education. Our plan at The University of Texas is to make our experimental school a working laboratory for the Department of Education and a center for educational research, the verification of educational principles, and the accumulation of educational data and statistics for the basis of the science of education. While the school will be equipped for demonstration and practice teaching, careful experimental work will be organized in such a manner as to give the training-teacher laboratory practice in technique in educational research under conditions which may be controlled, repeated, modified, and carried out through a series of years.

To recapitulate very briefly: we have come to a stage of development in our field when it is necessary to differentiate between the philosophy of education and the scientific principles of education, since the subject is not merely a critical discussion of facts and principles gathered from other sciences; neither is it merely a profession. It is an empirical science with its own data, its own viewpoint, its own problems and situations, its own history, and its own practices and opportunities for experimentation. It is largely through scientific experimentation that principles are established and "tried out," as indicated by the above type problems, the organization of courses in experimental education, and the establishment of experimental schools.

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THE PRESENT STATUS OF EDUCATION AS A SCIENCE

EDUCATIONAL METHODS

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Method to be followed in the paper.—In this paper I shall take up first a consideration of the status of the principles of educational methods from the standpoint of their origin, and then discuss the question of their scientific character. The discussion will concern primarily principles rather than practices, i.e., it will not be concerned so much with the actual efficiency of contemporary teaching as with the body of doctrine which forms the basis of this teaching. I am not interested in proving some radical thesis, but in establishing a basis for deliberative thought or discussion.

PRINCIPLES OF METHOD DIVIDED INTO FOUR CLASSES ACCORDING TO ORIGIN

For purposes of discussion, current principles of educational method may be divided, from the standpoint of source or origin, into four groups, as follows:

1. Those principles which have become current as the result of a long historical tradition which is characterized by more or less systematic a-priori analysis and argument.
2. Those derived from more recent developments in general psychological theory, such as the work of James and Dewey.
3. Those which are corollaries of the results of experimental psychology.
4. Those which have been reached by direct experimental and statistical investigation of actual schoolroom processes.

I shall take up each of these classes for consideration, and estimate the part which each plays in the determination of methods, giving certain examples under each class. To many critical readers of the paper the extended discussion of the first class may

seem superfluous, but it is needed to show how large a part of our principles of method are of this traditional a-priori type.

I. TRADITIONAL A-PRIORI PRINCIPLES OF METHOD

Principles given currency by Rousseau.—While many of the principles under this head may be traced back almost indefinitely, their currency during the nineteenth century and since is due largely to the Rousseau tradition. The following examples from the *Emile* indicate how large a part the principles of Rousseau have played in considerations of methods of teaching:

1. Methods of instruction should aim at many-sided maturing and training of the individual. (Emphasized by Pestalozzians as "harmonious training of the faculties" and by Herbartians as "many-sided interests.")

2. Methods of teaching should be adapted to the maturing of the child's instincts and capacities. (Especially emphasized by Froebelians.)

3. Real experiences (with things or persons) should be the starting-point of instruction. (Developed primarily as Pestalozzian object-teaching.)

- a) Hence, home geography should be the starting-point of geography teaching. (A direct connection from Rousseau through Salzman, Pestalozzi, Karl Ritter, Arnold Guyot, Colonel F. W. Parker to the Frye geographies of today.)

4. Children learn through motor activity which should not be wasted in random play, however, but should be connected with observation, reasoning, and expression, especially drawing. (Emphasized by Basedow, by Pestalozzi to a limited extent, by the Froebelians and Dewey.)

5. Premature memorizing of words and symbols without understanding is pernicious and spoils the child's judgment. (Emphasized at first by Pestalozzians, but soon degenerated; revived by Hebartians and Froebelians.)

6. The ability of children to reason about matters within their comprehension justifies emphasis on the investigation of small problems of applied science. (This principle was long neglected. It was emphasized somewhat by Froebelians and especially by Dewey.)

7. The study of social relations should be approached from the industrial standpoint. (Emphasized somewhat by Basedow, Pestalozzi and Froebel; recently given special emphasis by Dewey.)

a) Robinson Crusoe should serve as a central core for a study of problems in applied science, and as a basis of approach to the study of industrial and social relations.

8. The child's present interests and curiosity should motivate instruction in the earlier years, and his appreciation of the utility of the school processes in later years. (Emphasized by Basedow and the Herbartians and Froebelians; now being emphasized in the reconstruction of upper-grade teaching and high-school mathematics.)

Principles given currency by the Pestalozzians: Objective oral methods.—The Pestalozzian principles, many of which are current today, were to a considerable extent simply applications of principle 4 above (namely, real experience as the starting-point of instruction), combined with the method of simultaneous oral class instruction. Under this head come methods of oral and written composition, home geography, object teaching which developed later into elementary science, and the methods of primary arithmetic, especially mental arithmetic and the objective phase of the Grube method. In this connection the Pestalozzians carried out, independent of the influence of Herbart, the elaboration of oral instruction which has come to be identified in the minds of many persons with the steps of preparation and presentation in the Herbartian formal steps. Warren Colburn went even farther, and in the preface of his *Intellectual Arithmetic*, published in Boston in 1821, formulated what he called the method of "analytic induction," which parallels the Herbartian steps. Inasmuch as Colburn's book was widely used in America until after the middle of the nineteenth century, it is fair to assume that many American teachers were acquainted with the process represented in the Herbartian steps before these were popularized in the nineties.

Simple to complex.—A second Pestalozzian principle, namely, proceeding from the simple to the complex, has been at the basis of methods of teaching many of the subjects, and these methods are still dominant in many places. This principle is at the basis of

the synthetic method of teaching reading by beginning with letters or simple sounds; of teaching drawing and writing by beginning with straight lines, curved lines, etc.; of gymnastic systems which begin with elementary movements, etc. Combined with the Pestalozzian principle of thoroughness, it is the basis of one aspect of the Grube method in arithmetic.

Principles given currency by Herbartians.—When we consider the Herbartian elements in contemporary methods, we find two of the most distinctive to be the formal steps of instruction and the principles of correlation. As suggested above, the first two formal steps, namely, preparation and presentation (Pestalozzian oral instruction), are commonly most emphasized in practice and in discussions. Thus in McMurry's *Method of the Recitation*, 110 pages are devoted to a discussion of the first two steps, and 50 pages to the last three steps. Further, as Thorndike says, step 3 is often made for the pupil by the teacher; and step 4 is brief and usually comes of itself, once step 3 is successfully carried through.

In view of the insistence that is often placed on the completion of the formal steps in every unit of instruction or series of lessons, it is interesting to note Sallwark's contention (in K. A. Schmid's *Geschichte der Erziehung*, Vol. IV, Part II, p. 816) that neither in his theory nor in his practice at Göttingen did Herbart consider these steps in the teaching of lessons, but rather as steps in the organization of a subject as a whole, and even years might elapse between the first and fourth steps. Similarly, in connection with the principle of correlation it is interesting to notice that Herbart specifically opposed the practice of concentration, which promised to attain some popularity in America in the nineties. (See Herbart's *Outlines of Educational Doctrine*, paragraph 219.)

Froebelian elements in present educational methods.—Finally, when we come to the Froebelian elements in contemporary methods, we find the most distinctive ones to be, first, the emphasis on motor expression for general educative purposes, and, second, the emphasis on participation in a co-operative social situation as a basis of various reforms in methods. These principles are at the basis of much of the constructive work in the modern elementary schools, of the study of industries in connection with geog-

raphy, history, and arithmetic, and of the use of the real audience-situation as a factor in training in oral and written expression.

Such traditional a-priori principles constitute the largest part of contemporary principles of method. Only a few examples have been given, but the list could easily be prolonged until the stock of current principles was almost exhausted.

Background of these principles found in psychology of Locke, Herbart, etc.—To a certain extent the background of these principles of method consisted of the psychology which had been developed from Locke to Herbart, who probably rank with James as contributors to the development of psychology. The difference between this older psychology and more recent developments in general psychological theory is largely a matter of recency. As James said in 1899 (*Talks to Teachers*, p. 7): "In my humble opinion, there is no 'new psychology' worthy of the name. There is nothing but the old psychology which began in Locke's time, plus a little physiology of the brain and senses and theory of evolution, and a few refinements of introspective detail, for the most part without adaptation to the teacher's use. It is only the fundamental conceptions of psychology which are of real value to the teacher; and they, apart from the aforesaid theory of evolution, are very far from being new."

The theory of evolution which James mentions, however, put psychology on a definite *explanatory* basis which contrasts strongly with the *descriptive* character of much of the psychology which had preceded. For this reason we are justified in treating as a somewhat distinct group the principles of method suggested in the following heading:

II. PRINCIPLES OF METHOD DERIVED FROM RECENT PSYCHOLOGICAL THEORY

The best examples under this head are furnished in connection with the work and influence of such psychologists as William James and John Dewey. One example of principles of method derived from this source is the emphasis on motor expression as a factor in the learning process.

Evolutionary basis of emphasis on motor expression.—Rousseau emphasized the psychological importance of motor activity in

learning and thinking, and Froebel did the same largely on religious grounds. But with James we have a new point of view. In the first place, we have the evolutionary basis, that human characteristics have been evolved primarily in relation to man's survival as a behaving organism in a changing environment. Thus the evolution of the nervous system demonstrates that the neural basis of the higher mental processes has been evolved primarily as a means of establishing more intricate and indirect methods of relating motor responses to sensory stimuli.

In the second place, we have the psychological fact that there can be "*no impression without expression*," since every change in the sensory stimuli affecting a person produces some corresponding change in his muscular adjustment.

Valid educational corollaries of the psychological importance of motor expression difficult to determine.—When we turn from this psychological fact to its pedagogical corollaries we find an interesting contrast between the conclusions of the psychologists and the pedagogues. The latter, for the most part, have concluded that this fact of "no impression without expression" means necessarily that we must have manual training, dramatization, drawing, painting, modeling, and other forms of overt abundant physical activity. The psychologists, on the other hand (James, Thorndike, Judd, etc.), maintain (*a*) that the motor expression by the child is bound to take place whether the teacher explicitly provides for it or not—the child can't keep from it; (*b*) that verbal expression (speech and writing) is just as truly motor expression as is manual training, and (*c*) that verbal expression is much more important in the thinking and communication of civilized persons than the other forms of expression.

Analytic-synthetic learning emphasized by James.—A second example of contributions from the general psychology of James to the determination of principles of educational method is connected, with the principle of proceeding from the simple to the complex. Herbert Spencer, in his essay on *Intellectual Education*, maintained his belief in this Pestalozzian principle, and in his argument for it said, "Manifestly decomposable states of consciousness cannot exist before the states of consciousness out of which they are com-

posed. . . . [Hence] no articulate sound is cognizable until the inarticulate sounds which go to make it up have been learned." This theory of pure synthetic learning was vigorously attacked by James, and his statement that experience begins as a "big blooming buzzing confusion" has become classic. According to James, in the ordinary process of learning the mind begins by apprehending any new and strange situation as a vague, unanalyzed whole; proceeds by comparison or selective attention to break this whole up into its parts (as far as necessary for the practical purpose of the moment); and then reconstructs (synthetizes) these parts into an organized whole in which the relation of the parts is more or less clearly perceived. The purely synthetic methods of teaching which were based on the principle of proceeding from the simple to the complex are being replaced by methods which apply the analytic-synthetic principle which James discussed.

Dewey's analysis of reflective thought contrasted with the Herbartian analysis.—A third example of the influence exerted on principles of educational method by recent developments in psychological theory is the analysis made by Dewey of the process of reflective thought, and its relation to the Herbartian analysis as represented in the formal steps. The Herbartians are not always satisfied to consider the formal steps as an excellent artificial device to assist inexperienced teachers in planning their work, but are prone to argue that these steps correspond to the process of ordinary reflective thought. Dewey, in his analysis of the process of reflective thought, distinguishes the following elements, "(1) a felt difficulty; (2) its location and definition; (3) suggestions of possible solution; (4) development by reasoning of the bearings of the suggestion; (5) further observation and experiment leading to its acceptance or rejection." In comparing this statement with the Herbartian statement, Dewey says "We are struck by one difference: the Herbartian method makes no reference to a difficulty, a discrepancy requiring explanation, as the origin and stimulus of the whole process. As a consequence, it often seems as if the Herbartian method deals with thought simply as an incident in the process of acquiring information instead of treating the latter as an incident in the process of developing thought" (*How We Think*, pp.

72, 204). Dewey says further, that ordinary reflective thought proceeds in a zigzag fashion; that the steps in reflective thought are not separated as they are in the formal steps, but that there is a constant working back and forth between individual cases, generalizations, verifications, and applications. Hence, in the recitation, the factors distinguished in the Herbartian steps might appear in any order or without any order.

These three examples, namely, motor expression, the analytic-synthetic theory of learning, and the analysis of reflective thought, serve to illustrate the second large source of principles of educational method, namely, recent developments in general psychology.

III. PRINCIPLES OF EDUCATIONAL METHOD DERIVED FROM EXPERIMENTAL PSYCHOLOGY

Treated at length in Mr. Henmon's paper.—The third source of principles of educational method is the work in experimental psychology. Inasmuch as this source is discussed at length in the previous paper by Professor Henmon, it will suffice to cite only a few examples here, although from the standpoint of its importance in establishing scientific principles of method it deserves more extended treatment than either of the preceding sources.

Investigations of learning process justify optimistic attitude.—The pessimistic attitude concerning the value of experimental psychology for teachers taken by Münsterberg and paralleled somewhat by James in his *Talks to Teachers* (1899) is very well known. This attitude was based partially on the results of laboratory investigations which up to that time had been concerned largely with sensory and perceptual process, reaction time measurements, etc., and which seemed to have little bearing on the more complicated processes of learning with which teachers are concerned. The investigation of the psychology of the learning process, which has received more attention in recent years, has developed a body of conclusions, however, which certainly justifies a more optimistic attitude. On the other hand, examples could be cited from the earlier experimental work which were important in their relations to method. One such example is the early work of Cattell on the number of objects which can be perceived at a glance. This work

demonstrated that often whole words can be perceived as readily as single letters, and is important in its relation to the word method of teaching reading as distinguished from the alphabet-syllable method. But the experiments on the learning process, namely, motor learning, memorizing, practice, etc., which have been developed in recent years are especially significant in their relation to principles of method.

Principles derived from the study of motor learning.—A significant example of these investigations is the work on motor learning carried on by Thorndike and others in connection with the learning of animals and by Judd and others in connection with motor activities similar to those involved in writing. In relation to educational methods, these investigations bring out the importance (1) of the method of trial and accidental success; (2) of the part played by diffusion of movement, and the consequent importance of selection based on feelings of satisfaction and dissatisfaction; (3) of the fact that in such processes the learner's attention is commonly focused primarily on the objective result of the movement and that attention to the actual movement plays a relatively small part, although the movement sensations are important factors in directing the activity.

Principles of economy in memorizing.—Another example of the results of experimental psychology serving as a source of educational methods is the large amount of work which has been done on memorizing. Perhaps the most significant conclusion of this work concerns the superiority of the "whole" method of memorizing over the "part" method. Other significant conclusions are the probable superiority of distributing the time spent on memorizing instead of concentrating it, and the use of the method of recall instead of dependence entirely on repetition of the stimulus. The applications of these conclusions in teaching are obvious. The study reported by Pyle and Snyder in the *Journal of Educational Psychology* (II, p. 133, 1911) is a typical example of this work on memorizing.

Experiments on practice promise to be an important source of principles of method.—A broader heading under which may be included the work on motor learning and the study of intellectual

associations involved in memorizing is the work on practice. It seems probable that in the near future many of our educational methods will be determined by experimental results which will be summarized under this head. Examples of such experimentation are the ball-tossing and typewriting experiments described by E. J. Swift in his chapter on "The Psychology of Learning" in his book entitled "*Mind in the Making*," and the work on memorizing vocabularies reported by W. F. Dearborn in the *Journal of Educational Psychology* (September, 1910, p. 384). While the pedagogical corollaries to be derived from the results of such experiments are not definitely established, it is certain that they give us a much clearer understanding of the learning process, which is the first step toward the establishment of valid methods of instruction.

IV. PRINCIPLES OF METHOD DERIVED FROM EXPERIMENTAL AND STATISTICAL STUDY OF SCHOOLROOM PROCESSES

Technique similar to that of experimental psychology.—The fourth source of the principles of educational methods is the experimental and statistical investigation of actual schoolroom processes, such as writing, spelling, reading, arithmetic, composition, etc. These investigations are often quite similar in their technique to those described under the previous heading, but they vary in what might be called the "subject-matter" of experimentation. Thus the experimentation on writing parallels the investigation of motor learning; the experimentation on spelling may parallel that on memorizing, etc.

Analytical study of processes vs. statistical study of results.—These investigations may be divided into two classes: first, those which involve a minute analysis of the psychological processes involved in the school activities; and second, those which involve a statistical study of the correlations which exist between certain educational methods and educational results, often without any very definite psychological analysis or explanation of this correlation. The experiments of Dodge and Dearborn on reading and of Judd and Freeman on writing are examples of the first class, and the work of Cornman on spelling and of Stone and Courtis on arithmetic are examples of the second class. The statistical method

seems to have the advantage from the standpoint of getting results quickly, while it may be claimed for the method of careful analytic study of a few cases that its results give us a better understanding of the learning process involved. The two methods are closely interrelated, inasmuch as the statistical method suggests, locates, and defines problems for which an analytic study may determine the answers.

Analytic-experimental studies: Conclusions from experimentation on reading.—W. F. Dearborn's *Psychology of Reading* (1906) and E. B. Huey's *Psychology and Pedagogy of Reading* (1909) may be considered among the best examples of American reports of the results achieved by the analytic-experimental method. While the results for methodology are meager compared with the amount of experimentation that has been done, certain very significant points stand out. Perhaps the most important of these is the difference between "oral-reading habits" and "silent-reading habits." The great variation in the speed of different persons in silent reading has demonstrated the great possibilities of improvement in the silent-reading habits of most persons. The incipient articulation which most readers carry on as a part of their silent-reading habits, and which has been developed by the methods of exclusive emphasis on oral reading in the schools, keeps most persons far below the silent-reading speed which it is possible for them to attain by improved methods. These results verify and strengthen the contention that special care should be devoted in the school to the development of proper silent-reading habits. The laboratory experiments on reading are giving us some insight into the complicated nature of these silent-reading processes.

Experiments on writing.—Next to reading, the subject that has been most effectively investigated by the analytic-experimental method is writing. Judd, McAlister, Freeman, Woodworth, and others have done important work in this field. Mary E. Thompson's *Psychology and Pedagogy of Writing* (1911) furnishes for teachers a very good summary of the results of these investigations. These results are comparatively meager as far as the methodology of teaching writing is concerned. One of the most definite conclusions that has been drawn is McAlister's old result concerning

the superiority of the so-called "natural" slant from the standpoint of speed in writing. A somewhat more indefinite conclusion is that learning to write parallels the development of other processes involving motor skill, and exhibits the same characteristics as appear in all the practice experiments on motor skill, such as tossing balls, etc. In the early stages, the mastery of the form is the fundamental factor and speed is relatively unimportant. After the form is mastered the speed may mount up very rapidly. This fact would seem to indicate the importance of subordinating speed to form in teaching writing in the early school years. Later, special emphasis should be placed on speed, with sufficient attention to form to keep this from deteriorating.

Statistical studies: Arithmetic.—The statistical studies made by Stone and Courtis of arithmetical methods and results are among the best examples of this type of investigation. They have shown that it is possible to measure exactly the relative efficiency of different methods of teaching arithmetic, and have established certain standards of measurement and principles of technique.

C. W. Stone's dissertation on *Arithmetical Abilities* (1908) is particularly important as emphasizing this element of the technique of statistical measurement; hence it is greatly superior to the earlier work of Rice. The continuation of Stone's work by S. A. Courtis, as described in the *Elementary School Teacher* (Vol. X, pp. 58, 177; Vol. XI, pp. 171, 360, 528, and Vol. XII, p. 127) has developed a system of quite definite standards of achievement for all the grades in the elementary schools in the various phases of arithmetic. By the use of these standards of measurement it is possible for any teacher or administrator to determine precisely and objectively the progress and relative success of the classes in arithmetic. The work of Courtis is one of the most striking examples which we can find in English of a thorough study of some school process, extended through a number of years, and conducted very ably by a person regularly employed in the school, as a part of his daily concern with its affairs. It is also a very striking example of the close relation existing between statistical methods and analytic-experimental methods in the investigation of a school-room activity.

Spelling.—"The Scientific Study of Spelling," published recently by H. C. Pearson in the *Journal of Educational Psychology* (Vol. II, p. 241, 1911), is significant in comparison with the broader study by Cornman of spelling in the Philadelphia schools (1902), which is so well known. Pearson endeavored to isolate one problem in the teaching of spelling, namely, to determine whether homonyms should be taught separately or together. He conducted separate rooms of each grade from the third to the seventh by each method and measured precisely the comparative results. He accepts his results tentatively as establishing the superiority of the "together" method.

These references to actual investigations of schoolroom processes are but a few of the many that could be cited which parallel experimental psychology and the statistical sciences in the development of the technique of investigation. It remains to discuss the question of the scientific character of all the classes of principles of method which have been reviewed. Before doing this, it will be interesting to note again the four classes of principles and certain general textbooks which belong to each class.

TEXTBOOKS ON METHOD CHARACTERISTIC OF EACH CLASS OF PRINCIPLES

The following are examples of the method texts which are characteristic of the classes of principles of method which we have been discussing. Others equally typical could be cited.

I. A-priori traditional principles: Herbart's *Outlines of Educational Doctrine* and McMurry's *Method of the Recitation*.

II. Principles based on recent general psychology: James's *Talks to Teachers* and Thorndike's *Principles of Teaching*.

III. Principles derived from experimental psychology: Thorndike's *Principles of Teaching* and the works of Meumann and Bardt in German and Colvin's *Learning Process* (1911) in English.

IV. Experimental study of schoolroom processes: Judd's *Genetic Psychology for Teachers*.

ARE THESE PRINCIPLES OF METHOD PART OF A SCIENCE OF EDUCATION?

Probably some of the readers of this paper have been surprised at the failure, up to this point, to consider whether the principles

of method which have been discussed may be classed as scientific conclusions or not, and have hoped for vigorous discussion of this point. Personally, I have little interest in the controversial possibilities suggested by the question. It seems to me that "the present status of educational methods" is a very important topic for discussion, and any organized endeavor to improve it by means of the best tools of inquiry, research, and art is equally important. But the question as to whether any subject of study is or may become a science has been discussed so much that it seems a waste of time to carry it farther. It simply involves a reiteration of what Huxley said in 1854, with special reference to biology, but which he made general in its application (*Lay Sermons*, chap. v, entitled "Educational Value of Natural History Sciences," p. 77).

Huxley maintained unity of scientific method in 1854.—In answer to certain objections which had been raised against the possibility of biology being a science, he said:

Now a great deal is said about the peculiarity of the scientific method in general, and of the different methods which are pursued in the different sciences. The mathematics are said to have one special method, physics another, biology a third, and so forth. For my own part, I must confess that I do not understand this phraseology.

The subject-matter of biological science is different from that of other sciences, but the methods of all are identical; and these methods are—

1. Observation of facts—including under this head that *artificial observation* which is called *Experiment*.

2. That process of tying up similar facts into bundles, ticketed and ready for use, which is called *Comparison* and *Classification*—the results of the process, the ticketed bundles being named *General propositions*.

3. *Deduction*, which takes us from the general proposition to facts again, teaches us, I may say, to anticipate from the ticket what is inside the bundle. And finally—

4. *Verification*, which is the process of ascertaining whether, in point of fact, our anticipation is a correct one.

Such are the methods of all science whatsoever (*ibid.*, p. 83).

Karl Pearson reiterates this point of view. From the time of Huxley to the recent work of Karl Pearson and John Dewey, this view of the unity of scientific method has had more or less currency. It is hardly necessary to quote the well-known statement by Pearson:

The unity of all science consists alone in its method, not in its material. The man who classifies facts of any kind whatever, who sees their mutual relation and describes their sequences, is applying the scientific method and is a man of science (*Grammar of Science*, p. 12, 2d ed.).

Differences of opinion concerning nature of scientific method; "predicting."—While there is considerable agreement as to the unity of scientific method, there is some disagreement concerning its nature; for example, concerning the relations in point of time of the two following elements: (1) observation, or acquaintance with many individual facts, and (2) hypothesis, or the use of the imagination in constructing general principles of explanation. Another point of disagreement concerns the question of exactness or quantitative precision in scientific statements. Huxley discussed this question of exactness in 1854 in connection with biology and coupled it with the question of "predicting," which is another point of difference of opinion at the present time. Thus, he said:

Is it then the *results* of biological science which are "inexact"? I think not. If I say that respiration is performed by the lungs; that digestion is effected in the stomach [etc.], I am enumerating propositions which are as exact as anything in Euclid. How then has this notion of the inexactness of biological science come about? I believe from two causes: first, because, in consequence of the great complexity of the science and the multitude of interfering conditions, we are very often only enabled to predict approximately what will occur under given circumstances; and secondly, because on account of the comparative youth of the physiological sciences a great many of their laws are still imperfectly worked out. But . . . it is most important to distinguish between the essence of a science and the accidents which surround it; and essentially the methods and results of physiology are as exact as those of physics or mathematics (*op. cit.*, p. 79).

Is mathematically precise measurement necessary to a science of education?—Similarly, even among those who are engaged in the study of education, there is more or less implied difference of opinion concerning the necessity of mathematical precision in a science of education. To some students a relatively unprecise investigation of children's interests leading to the conclusion that "the use of games in teaching multiplication increases the children's interest" would be scientific, and they would argue that this is as exact as Huxley's statement that "respiration is performed by

the lungs." On the other hand, the element of mathematically precise measurement is emphasized by such investigators as Thorndike, who is particularly strong in his denunciation of the habit of depending upon the first source of educational methods described in this paper (the historical) and, by implication, of the second source (general psychology) as well. Writing in 1903, he said:

It is the vice or misfortune of thinkers about education to have chosen the methods of philosophy or of popular thought instead of those of science. We ruminate over the ideas of Pestalozzi or Herbart or Froebel, as if writing a book a hundred years ago proved a man inspired. . . . In education everything is said, but nothing is proved. There is a plentiful lack of knowledge, while opinions more and more abound. They are often very good of their kind, but they are not science. . . . The science of education when it develops will, like other science, rest upon direct observations and experiments on the influence of educational institutions made and reported with quantitative precision (*Educational Psychology*, p. 164, 1st ed.).

Even if we follow Thorndike, and eliminate from a possible "science of educational methods" the first two sources which were discussed above (a-priori traditional and general psychological), it is easy in connection with the third and fourth sources (experimental psychology and direct experimental and statistical investigation of methods) to demonstrate that such a science has "arrived" and is with us "essentially," as Huxley said of biology in 1854. Hence if the question were narrowed to read, "Is education an experimental science which uses reliable methods of control and secures precise measurements of results?" we may prove that it has reached even this stage of development in connection with certain of its problems; and no better evidence need be cited than such studies as those of Courtis on arithmetic and other studies which were mentioned above.

Such a case for education as a science based on precise experimental investigation ought to satisfy the most extreme objector. This done, it might be worth while to consider further whether the type of educational analysis described above under Class II, and which parallels general psychology, is not just as "scientific" as such psychology, even though it is not characterized by precise measurement.

THE PRESENT STATUS OF EDUCATION AS A SCIENCE

EDUCATIONAL METHODS

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1. Some odd uses of the term "*Principle of Method*" in the early part of Professor Parker's article caused me to wonder why he did not define this term so as to avoid ambiguity. For example, on p. 136 he includes the statement, "Methods of instruction should aim at many-sided maturing and training of the individual," as the first a-priori principle of method. On p. 138, also, he refers to "the Pestalozzian principle of thoroughness." Just what is meant by this term, then? Can *any* aim or *any* method of procedure properly be called a principle of method?

But there is a far more important reason for defining this term. Most of the principles of method enumerated by Professor Parker concern the learning process; they are statements of procedures found advisable or necessary in the acquisition of knowledge, or at least are interpreted in that light by him.

Yet in opposing the Herbartian formal steps of instruction, he quotes Dr. Dewey's assertion that, "It often seems as if the Herbartian method deals with thought simply as an incident in the process of acquiring information, instead of treating the latter as an incident in the process of developing thought."

Now I am inclined to agree with Dr. Dewey's criticism quite heartily. But if it is true that the process of *acquiring* information should be regarded as only an incident in the process of *developing* thought, is not our usual treatment of method nearly as narrow as the Herbartian formal steps? The watchwords of modern method—such as apperception, induction, deduction, vizualization, summaries, drills, reviews, generalizations, etc.—find their center in the learning process.

If the main question determining the scope of method is "How to think," or "How to overcome obstacles," rather than "How to

learn," is it not probable that the content of method should be quite different from what it is now, and broader? A successful man of the world, who is accustomed to the thinking necessary to overcome serious obstacles daily, in testing an applicant for a position with him would not inquire primarily about how much he knew. There are other things more important, such as independence, good judgment, attention to system, and power of initiative, that would probably be preferred subjects of inquiry. More than that, I have repeatedly found that experienced teachers who will tell readily how they would teach a topic (so that pupils might acquire knowledge), remain silent or hesitate when asked, "What are the main things we must do in order to 'think,' or overcome difficulties, and how are those things to be done?" In other words, the two questions are not duplicates, and "method" is too narrowly interpreted when it signifies merely "method of learning."

2. The object of Professor Parker's article, as I understand it, is to determine the status of education as a science in the field of method. In performing this task he is certainly right in refusing to discuss the general question, Is education a science? That would be fruitless. The main question is, Is our method of treating questions on educational method scientific?

The plan of discussion consists first in an enumeration of some principles of method, with the purpose, as he states in his first sentence, of discussing their scientific character. The gist of his paper should then, as I see it, be found in this second part. Yet examination of that part proves extremely disappointing. For, while quoting from Huxley to show what is meant by "scientific," he even refuses to apply Huxley's standard to most of his enumerated principles. After setting out to "discuss their scientific character" (p. 135) he declares (p. 147): "Probably some of the readers of this paper have been surprised at the failure, up to this point, to consider whether the principles of method which have been discussed may be classed as scientific conclusions or not, and have hoped for vigorous discussion of this point only. Personally I have little interest in the controversial possibilities suggested by the question." Yet in the remaining few pages he takes up this

problem, and in his last sentence declares, "Hence, if the question were narrowed to read, 'Is education an experimental science which uses reliable methods of control and secures precise measurements of results?' we may prove that it has reached even this stage of development in connection with certain of its problems." In other words, a very few of our principles of method have been treated scientifically. But what about the great majority? Anyone identified closely with education knew already that there was a little scientific work going on there. But most of our principles are, as he says, of the "a-priori traditional" sort, or are "based on recent general psychology." Can nothing be said about these? Is the whole procedure unscientific there? Has no progress been made in this field in recent years? Are not some of these principles worthy of rejection from the point of view of science? And are not others, likewise, worthy of acceptance?

Take the Pestalozzian principle, "simple to complex." Is not that a so-called principle that can be disproved as often as proved? What would be proof here? Is it not already largely rejected as a principle? Is it impossible to determine its status from the point of view of science? Does it command the same respect, scientifically, as the principle of apperception? Can it truthfully be said that this principle of apperception has been approached only by an a-priori method?

I should think that the writer would have found his main task in the consideration of such questions as these. Omitting such discussion, I have difficulty to determine wherein the contribution of the author consists.



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